

The affordances of mobile learning for an undergraduate nursing
programme: A design-based study

Juliana Willemse

Student Number: 9434329

A thesis submitted in fulfilment of the requirements for the degree of
Doctor Philosophiae in the School of Nursing, University of the
Western Cape



UNIVERSITY *of the*
WESTERN CAPE

Supervisor: Professor K. Jooste

Co-Supervisor: Professor V. Bozalek

Date: November 2018

DECLARATION

By submitting this assignment electronically, I declare that the entirety of the work contained therein is my own, original work, that I am the sole author thereof (save to the extent explicitly otherwise stated), that reproduction and publication thereof by the University of the Western Cape will not infringe any third-party rights and that I have not previously in its entirety or in part submitted it for obtaining any qualification.

Date: November 2018



UNIVERSITY *of the*
WESTERN CAPE

ABSTRACT

The global use of mobile devices, and their connectivity capacity, integrated with the affordances of social media networks, provides a resource-rich platform for innovative student-directed learning experiences. Technology has become embedded in the daily lives of students, who become more approachable when technology is used within the higher education context. In 2014 the Educause Centre for Analysis and Research partnered with 213 higher education institutions across the United States of America. It was established that 86 percent of undergraduate information technology students owned a smartphone and half of that percentage owned a tablet. A systematic review on mobile learning in higher education focusing on the African Perspective in 2017 concluded that there was an increase in the use of mobile learning in higher education.

Higher education institutions continue to move away from traditional, lecture-based lessons towards new, innovative teaching and learning methodologies to facilitate emerging pedagogies and strategies, thereby enhancing student learning. The adoption of technological innovation could promote the unfolding of a social process that over time could enhance social connectedness among young students and their older adult educators.

Mobile learning is fundamentally defined as “learning with mobile devices” and it has the potential to extend the philosophies of learning through innovation. It was identified that research in the field of m-learning can be divided into four areas, namely: pedagogy; administrative issues and technological challenges; ensuring sustainable development in education using m-learning; and the impact of new applications.

With the increased need for nursing professionals, promoting the quality and effectiveness of nursing education has become crucial. It is thus important to establish learning environments in which personalised guidance and feedback to students regarding their practical skills and the application of their theoretical knowledge within clinical learning environments is provided.

The purpose of this study was to explore and describe the affordances of m-learning in an undergraduate nursing programme at a higher education institution in the Western Cape Province. The methodological design used in this research study was the systematic, yet flexible, Integrative Learning Design Framework, a design-based research model (Dabbagh & Bannan-

Ritland, 2005). This framework includes three phases, namely the exploration phase, the enactment phase and the evaluation phase.

Phase 1, the exploration phase (situational analysis) of the study used quantitative and qualitative research methods to inform the development of a plan for the intervention. Phase 1 included a literature review. The literature review informed the collation of a quantitative survey exploring the knowledge of undergraduate students and lecturers and clinical facilitators on the use of mobile devices. The quantitative, exploratory, descriptive research design method (electronic survey) investigated participants' knowledge and use of mobile devices. The total sample consisted of all third-year undergraduate nursing students (n=114) registered for the primary care and clinical skills module (a semester module) and lecturers and clinical facilitators (n=6) who facilitated this module at a higher education institution in the Western Cape Province. Descriptive statistics, obtained from an electronic survey which took around 30 minutes to complete.

A qualitative design explored and described students' and lecturers and clinical facilitators' perceptions on the integration of theory and clinical practice of the ear, nose and throat health assessment in the primary care and clinical skills module through mobile learning in an undergraduate nursing programme at a higher education institution in the Western Cape Province. The accessible population served as the total sample of all third-year undergraduate nursing students registered for a primary care and clinical skills module (n=114), and lecturers and clinical facilitators (n=6) who facilitated this module at a higher education institution in the Western Cape Province. The qualitative data was collected from students through four focus groups and eight individual interviews. One focus group session and three individual interviews were used to collect data from the lecturers and clinical facilitators. This was followed by a discussion with lecturers and clinical facilitators.

All sessions were audio-recorded and validated through member-checking after transcription. The data collected was categorised into emerging themes and sub-themes. The data analysis by the researcher was guided by Tesch's (1990) systematic process, and an independent coder reviewed the data and, through consensus, themes and sub-themes were confirmed.

In *Phase 2*, the enactment phase, a plan was developed for the integration of theory and clinical practice of the ear, nose and throat health assessment in the primary care and clinical skills

module through mobile learning. An intervention was then conducted with the plan. The perceptions of students, lecturers and clinical facilitators described the intervention, designed to integrate the theory and clinical practice of the ear, nose and throat health assessment in the primary care and clinical skills module through mobile learning. This was conducted through three iterations. Participants in this phase included third-year undergraduate nursing students registered for a primary care and clinical skills module, and lecturers and clinical facilitators who facilitated this module. Throughout this phase, data was collected through the submission of electronic reflections at the end of every of the three iterations, followed by focus groups after the third/ final iteration. Trustworthiness during the qualitative phase was ensured through credibility, transferability, dependability and confirmability. In the enactment phase, the researcher also generated strategies that were congruent with theories of learning for the intervention. During the intervention development phase, solutions were explored to integrate the theory and clinical practice of the ear, nose and throat health assessment using the Activity Theory of Engeström (2008) to guide the implementation and evaluation of the intervention, supported by the affordances model of Bower (2008). Also, in Phase 2 the implementation of the intervention was developed.

In *Phase 3*, participants (students, lecturers and clinical facilitators) were requested to reflect electronically on their experiences during the implementation of the plan developed (*intervention*) to enhance the integration of theory and clinical practice of the ear, nose and throat health assessment in the primary care and clinical skills module through mobile learning.

During the evaluation of the intervention in Phase 3, recommendations were described to guide lecturers and clinical facilitators on how to enhance the integration the theory and clinical practice of the ear, nose and throat health assessment in the primary care and clinical skills module through mobile learning.

The *findings* identified the need to include training in information and communication technology into educational practice at higher education institutions to ensure the necessary competency of educators in instructional design was identified. The draft design principles were thus refined throughout the three iterations and design principles to be recommended for a final mobile learning intervention. The draft design principles thus provided a foundation for the development of the intervention plan for the intervention to enhance the integration of theory

and clinical practice of the ear, nose and throat health assessment. This study produced 24 refined design principles

WhatsApp Messenger was identified by students and lecturers and clinical facilitators as the best method of online communication, enhancing integration of theory and clinical practice of the ear, nose and throat health assessment due to affordances offered, which include: *affordability, link-ability, share-ability, write-ability, readability, view-ability, video-production-ability, speak-ability, listen-ability and move-ability*. WhatsApp Messenger afforded real-time communication. Lecturers and clinical facilitators were able to respond to activities submitted by students immediately in real-time, which afforded a great learning platform.

Challenges with Internet connectivity and the availability of data bundles impacted accessibility to online learning tasks communicated to students using WhatsApp Messenger. Ensuring network coverage and free Wi-Fi is of importance for a successful mobile learning intervention. Even though the production of videos to illustrate their examination techniques of the ear, nose and throat health assessment was viewed as time consuming, students did acknowledge that it was a positive learning experience. Technical difficulties were experienced with some functions of personal mobile devices during the enactment.

It can be *concluded* that the advancements in mobile technology offer post-Web 2.0 pedagogical affordances for teaching and learning that enables engagement with students. The role of social interaction has to be acknowledged in the cognitive development of the student, supported by an appropriate learning theory, e.g. situated learning. Preparation of all students and lecturers and clinical facilitators for an authentic WhatsApp Messenger ensures the success of a mobile learning intervention. The mobile learning platform created, WhatsApp Messenger, proved effective in providing a platform for the engagement of students and lecturers and clinical facilitators, with students acting as each other's more knowledgeable peers.

Keywords:

affordances; mobile learning; undergraduate nursing programme; design-based research; social constructivism; situated learning; authentic learning; flexible learning; blended learning; WhatsApp Messenger

ACKNOWLEDGEMENTS

First, I would like to express my gratitude towards my Heavenly Father for providing me with the wisdom and strength to complete this dissertation. Philippians 4:13 (NKJV): *“I can do all things through Christ who strengthens me”*.

To my research supervisors, Professors Karien Jooste and Vivienne Bozalek: I will forever be appreciative of your support and guidance throughout my research journey. Your constant encouragement and moral support helped me to persevere on this extremely “long” and taxing journey.

Management, colleagues and students from the School of Nursing who have contributed to the success of this research study: I am extremely grateful for all forms of input received.

I wish to dedicate my PhD dissertation to my pillar of strength: my mother, Magdalena Christine Solomons. I thank you, Mamma, for always believing in me, even in the darkest hours of my life. We might have experienced extreme poverty growing up, but you raised us principled, hardworking and God-fearing.

Special thanks to my husband, Jeremiah, and my three amazing children, Amy-Lee, Jessica and Emileo, for their enduring love and understanding. The accomplishment of this degree would not have been possible without your continued sacrifices and support.

To my amazing, supportive, loving and encouraging siblings: thank you for believing in my ability to complete my PhD and for always reminding me that I have visited long enough with family and had to go back home to my laptop.

Very special and heartfelt thanks to Elizabeth Barendse, my pillar of strength and second mother to my children. Thank you for your unselfish love and devotion to my family.

A great sense of appreciation is expressed towards my Petra Life Centre Family for all your loving support and prayers, especially Pastor Vicky and Felicity Coetzee.

I wish to acknowledge my independent coder, Janine Upton, who made time for clarification where needed.

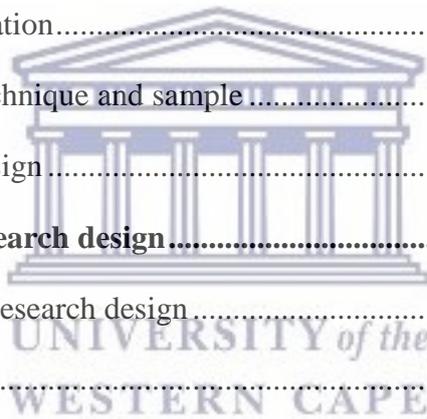
I hereby also acknowledge the support received from my editor, Helene van Niekerk of Linguafix, who assisted with the editing of my dissertation.

CONTENTS

DECLARATION.....	ii
ABSTRACT.....	iii
ACKNOWLEDGEMENTS	vii
CONTENTS.....	viii
FIGURES	xxii
DEFINITIONS AND TERMS OF REFERENCE.....	xxv
ACRONYMS AND ABBREVIATIONS.....	xxx
EMOTICONS EXPLAINED AND LINKED TO APPROPRIATE AFFORDANCES	xxxiii
1 CHAPTER: RATIONALE AND OVERVIEW OF THE RESEARCH STUDY	1
1.1 INTRODUCTION AND RATIONALE.....	1
1.2 EMERGING M-LEARNING TECHNOLOGY	3
1.3 MOBILE LEARNING IN THE CONTEXT OF THE WESTERN CAPE PROVINCE	6
1.4 TEACHING AND LEARNING APPROACHES AND PRACTICES IN MOBILE TECHNOLOGY	8
1.5 PROBLEM STATEMENT	9
1.6 PURPOSE OF THE STUDY.....	11
1.7 OBJECTIVES OF THE STUDY.....	11
1.8 CENTRAL THEORETICAL STATEMENT	12
1.9 PARADIGMATIC ASSUMPTIONS OF THE STUDY	12
1.9.1 Theoretical Assumptions.....	14
1.9.1.1 Social constructivism.....	14
1.9.1.2 Situated learning.....	17

1.9.1.3	Authentic learning	18
1.9.1.4	Flexible learning	19
1.9.1.5	Blended learning.....	20
1.9.2	Methodological Assumptions.....	20
1.9.2.1	Design-based research	20
1.9.2.2	Activity Theory System of Engeström (2008)	21
1.9.2.3	Affordances of Bower (2008).....	21
1.10	RESEARCH SETTING.....	21
1.11	RESEARCH DESIGN OF THE STUDY.....	22
1.11.1	Phase 1: The exploration phase (situational analysis).....	22
1.11.1.1	Phase 1: Quantitative phase.....	22
1.11.1.2	Phase 1: Qualitative phase.....	25
1.11.2	Phase 2: The Enactment.....	30
1.11.3	Phase 3: Evaluation through reflection	30
1.12	ETHICAL CONSIDERATIONS.....	33
1.13	CONTRIBUTION OF THE STUDY	33
1.14	DESCRIPTION OF CHAPTERS.....	33
1.15	SUMMARY.....	35
2	CHAPTER: METHODOLOGY	37
2.1	INTRODUCTION.....	37
2.2	DESIGN.....	38
2.3	RESEARCH SETTING OF THE STUDY	40
2.4	QUANTITATIVE AND QUALITATIVE PHASES (OBJECTIVES 1 AND 2)	44
2.5	PHASE 1: THE EXPLORATION PHASE.....	45

2.5.1	General principles and practices of Dabbagh and Bannan-Ritland (2005) followed in the exploratory phase	46
2.5.1.1	Document findings	46
2.5.1.2	Gather information about the instructional or training context	47
2.5.1.3	Examine individual perspectives on the learning process	47
2.5.2	Incorporate published perspectives on the learning process according to Dabbagh and Bannan-Ritland (2005)	47
2.5.2.1	Solicit perspectives and existing information on the learning process, content and online delivery method	47
2.5.3	Quantitative phase: Objective 1	48
2.5.3.1	Study population	48
2.5.3.2	Sampling technique and sample	49
2.5.3.3	Research design	50
2.5.4	Exploratory research design	50
2.5.4.1	Descriptive research design	50
2.5.4.2	Method	50
2.5.4.3	Pre-testing of the instrument	53
2.5.4.4	Preparation of the field	54
2.5.4.5	Implementing the electronic survey	55
2.5.4.6	Quantitative data analysis	57
2.5.4.7	Validity and reliability	57
2.5.5	Qualitative phase: Objective 2	59
2.5.5.1	Exploratory research design	60
2.5.5.2	Descriptive research design	60
2.5.5.3	Contextual research design	60



2.5.5.4	Study population.....	60
2.5.5.5	Sampling technique and sample	60
2.5.5.6	Data saturation.....	61
2.5.5.7	Method.....	61
2.5.5.8	Focus groups.....	62
2.5.5.9	Semi-structured individual interviews.....	63
2.5.5.10	Fieldnotes during interviews	63
2.5.5.11	Conceptualisation discussion group	64
2.5.5.12	Reflection diary	64
2.5.5.13	Transcribing qualitative data	64
2.5.5.14	Data analysis.....	65
2.5.5.15	Measures to ensure trustworthiness.....	66
2.5.5.16	Credibility.....	67
2.5.5.17	Transferability	67
2.5.5.18	Dependability	68
2.5.5.19	Confirmability	68
2.5.5.20	Reflexivity	68
2.5.6	Conclusion on the exploration phase	69
2.6	THE ENACTMENT PHASE – PHASE 2.....	69
2.6.1	Relate information gathered in the exploration phase to pedagogical models	70
2.6.2	Consider the instructional characteristics of the selected pedagogical models	70
2.6.3	Select specific instructional strategies that align with the selected pedagogical models	70
2.6.4	Enact the instructional strategies by using the features of technological delivery systems	71

2.6.5	Activity Theory (AT) of Engeström	71
2.7	THE EVALUATION PHASE – PHASE 3.....	75
2.7.1	Principles and practices followed in the evaluation phase.....	75
2.7.2	Clearly determining the purpose, desired results and methods of evaluation for online learning	76
2.7.3	Formatively evaluating the design and development prior to launching the online course.....	76
2.7.4	Revising the online materials according to the results of the formative evaluation	76
2.7.5	Implementing the online learning experience and evaluating the results according to the identified goals.....	76
2.8	RESEARCH ETHICS	77
2.8.1	Permission to conduct research.....	77
2.8.2	Informed consent	77
2.8.3	Voluntary participation	78
2.8.4	Anonymity and confidentiality	78
2.8.5	Privacy	78
2.8.6	The principle of beneficence	79
2.8.7	The principle of justice	79
2.9	DISSEMINATION OF THE RESEARCH RESULTS.....	79
2.10	SUMMARY.....	79
3	CHAPTER: LITERATURE REVIEW	81
3.1	INTRODUCTION.....	81
3.2	MOBILE LEARNING	82
3.3	M-LEARNING: AN EMERGING TECHNOLOGY	83

3.4	M-LEARNING: A NEW LEARNING PARADIGM	89
3.5	MOBILE LEARNING IN HIGHER EDUCATION INSTITUTIONS.....	93
3.6	MOBILE LEARNING IN NURSING EDUCATION	94
3.7	MOBILE LEARNING IN TEACHING AND LEARNING	96
3.8	THE PROCESS OF LEARNING: THEORIES AND APPROACHES	98
3.9	THEORIES OF LEARNING RELEVANT TO MOBILE LEARNING: SOCIAL CONSTRUCTIVISM AND SITUATED LEARNING.....	101
3.9.1	Social constructivism.....	101
3.9.2	Situated learning.....	103
3.10	‘BRING YOUR OWN DEVICE’ (BYOD)	104
3.11	THE AFFORDANCES OF MOBILE LEARNING.....	105
3.11.1	Historical origin of the concept of affordances.....	105
3.11.2	Concept of affordances according to Bower (2008).....	105
3.12	THEORETICAL PERSPECTIVES.....	106
3.12.1	Authentic learning.....	107
3.12.2	Flexible learning.....	108
3.12.3	Blended learning.....	108
3.13	CONCLUDING STATEMENTS IDENTIFIED AS DRAFT DESIGN PRINCIPLES	109
3.14	SUMMARY.....	111
4	CHAPTER: QUANTITATIVE RESULTS AND DISCUSSION	113
4.1	INTRODUCTION.....	113
4.2	FINDINGS	114
4.2.1	Section A: Biographical information	120
4.2.2	Section B: Being mobile (“mobileness”/mobile literacy).....	123

4.2.3	Section C: Internet connectivity	131
4.2.4	Section D: Communication	143
4.3	SUMMARY OF RESULTS.....	151
4.4	CONCLUDING STATEMENTS IDENTIFIED AS DRAFT DESIGN PRINCIPLES	154
4.5	CONCLUSION.....	155
5	CHAPTER: QUALITATIVE RESULTS AND DISCUSSION	157
5.1	INTRODUCTION.....	157
5.2	OVERVIEW OF PARTICIPANTS.....	158
5.3	FINDINGS: STUDENTS.....	160
5.3.1	Theme 1: Mobile devices as a mode of communication	161
5.3.2	Theme 2: Technology and web-based access	166
5.3.3	Theme 3: WhatsApp Messenger as a method of communication	168
5.3.4	Theme 4: Email as a method of communication.....	175
5.3.5	Theme 5: Facebook as a method of communication	177
5.3.6	Theme 6: Email, WhatsApp Messenger and Facebook as methods of communication.....	180
5.3.7	Theme 7: Maintaining professionalism within the clinical setting.....	181
5.3.8	Theme 8: Teaching and learning methodology.....	184
5.3.9	Theme 9: Setting personal boundaries	186
5.3.10	Theme 10: Other methods of communication.....	188
5.4	FINDINGS: LECTURERS AND CLINICAL FACILITATORS	189
5.4.1	Theme 1: Affordances of mobile devices enhances teaching and learning	190
5.4.2	Theme 2: Preferred methods of open dialogue/communication with students	193

5.4.3	Theme 3: Concerns regarding an implementation using mobile devices	197
5.4.4	Theme 4: Maintaining professionalism within clinical settings	199
5.4.5	Theme 5: Structuring a m-learning intervention	201
5.4.6	Theme 6: Managing/guiding groups to ensure direction and cohesion.....	204
5.5	CONCLUSION: STUDENTS	206
5.6	CONCLUSION: LECTURERS AND CLINICAL FACILITATORS.....	209
5.7	CONCLUDING STATEMENTS IDENTIFIED AS DRAFT DESIGN PRINCIPLES	210
5.8	SUMMARY.....	213
6	CHAPTER: DEVELOPING A PLAN FOR AN ENACTMENT (INTERVENTION)	214
6.1	INTRODUCTION.....	214
6.2	PREPARATION OF THE PLAN FOR THE INTERVENTION IN THE ENACTMENT PHASE	219
6.2.1	Strategic session with field specialist and preparatory workshop	219
6.2.2	Preparation workshop.....	219
6.3	OFFERING THE PLAN DURING THE WORKSHOP.....	225
6.3.1	The m-learning application for the instructional environment 	225
6.3.2	Examine individual perspectives on the learning process 	227
6.3.2.1	WhatsApp Messenger groups 	228
6.3.2.2	Time of interaction 	228
6.3.2.3	Role clarification 	229
6.4	MATERIALS USED DURING PRESENTATION OF THE WORKSHOP	229
6.5	THE WORKSHOP ETHICS	232

6.5.1	Written informed consent	233
6.5.2	Voluntary participation	233
6.5.3	Anonymity and confidentiality	233
6.5.4	Privacy	234
6.6	SUMMARY.....	234
7	CHAPTER: THE ENACTMENT AND REFLECTIONS OF THE THREE ITERATIONS IN THE ENACTMENT	235
7.1	INTRODUCTION.....	235
7.2	ACTIVITY THEORY SYSTEM (AT): THEORETICAL FRAMEWORK FOR THE ENACTMENT	237
7.2.1	Mediating artefacts.....	238
7.2.2	Subject	238
7.2.3	The community	238
7.2.4	The object	241
7.2.5	The tool	242
7.2.6	The rules of engagement	243
7.2.7	The division of labour: “Who does what?”	244
7.2.8	Outcome.....	244
7.3	OVERVIEW OF THE THREE ITERATIVE CYCLES	245
7.4	THE FIRST ITERATION: THE EAR	247
7.4.1	Theory session: Week 1	247
7.4.2	Clinical practice session: Week 2	248
7.5	REFLECTION AFTER THE FIRST ITERATION.....	252
7.5.1	Theme 1: The “accessibility” and “move-ability” of mobile devices afforded a great learning platform	253

7.5.2	Theme 2: Working in groups is an effective way of promoting link-ability and share-ability.....	258
7.5.3	Theme 3: The study was effective but time consuming, relating to “view-ability” and “video-production-ability”	261
7.5.4	Theme 4: Less accessibility experienced due to Internet access challenges ...	265
7.5.5	Theme 5: Less “accessibility” experienced due to technical difficulties.....	267
7.5.6	Theme 6: Busy clinical facilities and time constraints impacted on “view-ability”, “write-ability” and “video-production-ability”	269
7.5.7	Theme 7: “Permission-ability” proved to elicit ethical challenges.....	271
7.5.8	Theme 8: “Share-ability” and “view-ability” may afford copying of answers	273
7.6	RECOMMENDATIONS FOR THE SECOND AND THIRD ITERATIONS	282
8	CHAPTER: THE ENACTMENT AND REFLECTIONS ON ITERATION CYCLES TWO AND THREE.....	283
8.1	INTRODUCTION.....	283
8.2	THE SECOND ITERATION: THE NOSE AND SINUSES.....	283
8.2.1	Theory session: Week 3.....	283
8.2.2	Clinical practice session: Week 4	285
8.3	REFLECTIONS AFTER THE SECOND ITERATION.....	287
8.3.1	Theme 1: More positive experiences promoted accessibility.....	288
8.3.2	Theme 2: Working in groups with improved group cohesion enhanced “accessibility”, “link-ability” and “share-ability”	289
8.3.3	Theme 3: Communication of tasks in one message improved “accessibility” and “view-ability”	291
8.3.4	Theme 4: Supporting nursing personnel at clinical facilities promoted “link-ability” and “share-ability”	292

8.3.5	Theme 5: “Integrate-ability” stimulated revision and practice for examinations/tests	293
8.3.6	Theme 6: More time needed to complete tasks impacted “accessibility”, “browse-ability”, link-ability” and “share-ability”	294
8.3.7	Theme 7: No rush with activities as enough time was allocated for completion enhanced “accessibility”, “share-ability” and “integrate-ability”	295
8.3.8	Theme 8: Challenges experienced with “draw-ability”	296
8.4	THE THIRD ITERATION: THE MOUTH AND THROAT	303
8.4.1	Theory session: Week 5	303
8.4.2	Clinical practice session: Week 6	305
8.5	REFLECTIONS AFTER THE SECOND ITERATION CYCLE.....	307
8.5.1	Theme 1: Affordances offered for m-learning included “accessibility”, “readability”, “write-ability”, “video-production-ability” and “integrate-ability”	308
8.5.2	Theme 2: “Video-production-ability” afforded the improvement of clinical skills.....	311
8.5.3	Theme 3: “Share-ability” was improved when taking pictures. An affordance: “picture-production-ability” would have been appropriate.....	312
8.5.4	Theme 4: Third week was easier, thus promoting “accessibility”, “readability”, “write-ability”, “share-ability” and “integrate-ability”	313
8.6	RECOMMENDATIONS FOR FINAL REFINEMENT	314
8.7	SUMMARY.....	323
9	CHAPTER: CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS.....	324
9.1	INTRODUCTION.....	324
9.2	OVERVIEW OF THE STUDY.....	325

9.3 CONCLUSIONS FROM THE FINDINGS 326

9.4 RECOMMENDATIONS FOR FUTURE RESEARCH..... 327

9.4.1 Recommendations for teaching and learning 327

9.4.2 Recommendations for research 329

9.4.3 Recommendations for practice 330

9.5 LIMITATIONS OF THE STUDY 330

9.6 CONCLUSION..... 331

REFERENCES (APA 6th Edition) 332

ANNEXURES 375



UNIVERSITY *of the*
WESTERN CAPE

TABLES

Table 1.1: ILDF phases (Dabbagh & Bannan-Ritland, 2005)	22
Table 1.2: Summary of the research phases of Dabbagh & Bannan-Ritland (2005).....	31
Table 2.1: Examples of accredited clinical facilities in the WCP.....	42
Table 2.2: Examples of health facilities with free Internet access.....	44
Table 2.3: Main structure of the electronic instruments	52
Table 2.4: Five-point Likert scale	53
Table 2.5: Extract from the review of an expert in emerging technology	57
Table 2.6: Student surveys Cronbach's alpha coefficient of reliability.....	59
Table 2.7: Lecturers and clinical facilitators' survey's Cronbach's alpha coefficient of reliability	59
Table 2.8: Qualitative phase: study participants	61
Table 2.9: Division of labour supported the affordance model of Bower (2008).....	73
Table 2.10: Four higher-order functions of AT	74
Table 3.1: The post-Web 2.0 continuum	85
Figure 3.2: Global number of smartphone users from 2014 - 2020 (estimated in billions)	91
Table 3.2: Learning theories and the implications for instruction	100
Table 3.3: Classification of affordances	106
Table 3.4: Characteristics of authentic learning	107
Table 3.5: Rules identified as draft design principles.....	110
Table 4.1: Descriptive statistics on Likert Scale: Students.....	116
Table 4.2: Descriptive statistics: Lecturers and clinical facilitators	117
Table 4.3: Student use of applications on mobile device (n=84).....	139
Table 4.4: Lecturers and clinical facilitators use of applications on mobile device (n=6)	140

Table 4.5: Students' application of choice to review tasks (n=84).....	141
Table 4.6: Lecturers and clinical facilitators' application of choice to review tasks (n=6).....	141
Table 4.7: Use of mobile devices to enhance theory and clinical practice	146
Table 5.1: Qualitative data collection summary	159
Table 5.2: Themes and sub-themes (students).....	160
Table 5.3: Themes and sub-themes (lecturers and clinical facilitators).....	189
Table 5.4: Rules identified as draft design principles.....	210
Table 6.1: First refinement of the draft design principles for the intervention in the enactment phase	216
Table 6.2: Workshop preparation: guidelines for enactment (intervention).....	220
Table 7.1: Example of community linked to affordances of Bower (2008)	241
Table 7.2: The object linked to affordances of Bower (2008).....	242
Table 7.3: The tool linked to affordances of Bower (2008)	243
Table 7.4: Rules of engagement linked to affordances of Bower (2008)	244
Table 7.5: Affordances identified for the division of labour (Bower, 2008).....	244
Table 7.6: Allocation of theory sessions and clinical practice days	247
Table 7.7: Reflections on the first iteration: themes and sub-themes supported by affordances of Bower (2008)	252
Table 7.8: Refinement of the draft design principles after the first iteration.....	275
Table 8.1: Second iteration themes and sub-themes supported by affordances of Bower (2008)	287
Table 8.3: Recommended improvements for iteration three	303
Table 8.4: Third iteration themes and sub-themes supported by affordances of Bower (2008).....	307
Table 8.5: Refinement of draft design principles over three iterative cycles	315

FIGURES

Figure 1.1: Theoretical assumptions of Social Constructivism	17
Figure 2.1: Methodological framework - ILDF	40
Figure 2.2: Examples of HEIs in the WCP	41
Figure 2.3: Examples of locations of a DOH CHC	43
Figure 2.4: Examples of locations of a City of Cape Town Clinic	43
Figure 2.5: Research process	45
Figure 2.8: Complex structure of the activity system	73
Figure 3.1: Five keys of the Hype Cycle	88
Figure 3.3: Increase in the speed of bandwidth (Internet)	92
Figure 4.1: Gender of student participants	120
Figure 4.2: Gender of lecturers and clinical facilitators	121
Figure 4.3: Age distribution of participants	122
Figure 4.4: Duration of mobile device use: students	123
Figure 4.5: Duration of mobile device use: lecturers and clinical facilitators	125
Figure 4.6: Initial way of learning to use mobile devices: students	126
Figure 4.7: Initial way of learning to use mobile devices: lecturers and clinical facilitators	126
Figure 4.8: Seeking help when experiencing problems with mobile devices	128
Figure 4.9: Type of mobile devices used by students	129
Figure 4.10: Type of mobile devices used by lecturers and clinical facilitators	130
Figure 4.11: Internet connection used off-campus	133
Figure 4.12: Module-related access to library databases: Students	135
Figure 4.13: Module-related access to library databases: Lecturers and clinical facilitators	135
Figure 4.14: Preparedness to use their mobile devices off-campus (Item 12)	137

Figure 4.15: Students' preferred method of communication	144
Figure 4.16: Lecturers' and clinical facilitators' preferred method of communication.....	145
Figure 4.17: Willingness of lecturers and clinical facilitators to use their mobile devices	149
Figure 5.1: Tweet by Jan Koum on WhatsApp Messenger users (2014)	169
Figure 5.2: Number of monthly active WhatsApp Messenger users worldwide (Apr 2013–Jul 2017)	170
Figure 6.1: Instructional strategies/principles for the enactment.....	225
Figure 6.2: Guide to download the mobile application with the launch programme	226
Figure 6.3: Examples of the PHC, STGs and EML mobile application	227
Figure 6.4: PowerPoint presentation of the workshop.....	230
Figure 6.5: Participants at the workshop.....	231
Figure 6.6: Participant displaying her mobile devices.....	231
Figure 6.7: Participants displaying their personal mobile devices	232
Figure 6.8: WhatsApp Messenger download viewed at the workshop.....	232
Figure 7.1 Illustration of one iterative cycle in the enactment (intervention)	236
Figure 7.2: Refinements made after each of the three iterative cycles	236
Figure 7.3: Complex structure of the Activity Theory (AT) System (Engeström, 1999, based on Engeström 1987).....	237
Figure 7.4: Process of the three iterative cycles	245
Figure 7.5: Theory session: The ear.....	248
Figure 7.6: Instruction and responses: Review anatomy of the ear	249
Figure 7.7: Instruction and videos produced on the examination techniques.....	250
Figure 7.8: A guide on how to complete a case study	251
Figure 7.9: Presentation of a case study.....	251
Figure 8.1: Theory session: The nose and sinuses.....	285

Figure 8.2: Instructions to students on the 2nd iteration.....	286
Figure 8.3: Responses from students to their activities	286
Figure 8.4: Theory session: Mouth and throat	304
Figure 8.5: Third iteration instructions	305
Figure 8.6: Pictures on the examination of the mouth & throat.....	306



DEFINITIONS AND TERMS OF REFERENCE

Clinical facility or community health centre (CHC)

Clinical facility or community health centre refers to the place where healthcare can be accessed. In this study two CHC's were used as well as skills laboratory settings.

Higher education institution (HEI)

“A higher education institution (HEI) means any institution that provides higher education on a full-time, part-time or distance basis and which is-

- (a) Merged, established or deemed to be established as a public HEI under the Higher Education Act 101 of 1997, amended by 63 of 2002;
- (b) Declared as a public HEI under this Act; or
- (c) Registered or provisionally registered as a private HEI under this Act” (Higher Education Act, 1997, as amended in 2016).

A public HEI in the Western Cape Province participated in the study.

Nursing education institution (NEI)

A NEI means any NEI accredited by the South African Nursing Council in terms of the Nursing Act No. 33 (2005). In this study NEI refers to a school of nursing in the Western Cape Province.

Nursing

Nursing is a practice where the nurse assists a patient in an attempt to contribute to the health or the recovery of the patient in order to perform unaided actions with the necessary strength, will or knowledge. These activities involve the provision of physical and emotional support to the sick, helpless and wounded (Blackwell's Nursing Dictionary, 2005; Mosby's Medical Dictionary, 2014). According to the Nursing Act No. 33 (2005), nursing means a caring profession, practised by a person registered under Section 31, which supports, cares for and treats a healthcare user to achieve or maintain health, and, where this is not possible, cares for a healthcare user so that he or she lives in comfort and with dignity until death.

Undergraduate programme

This is a study to acquire a first degree, called a bachelor's degree, at a South African Qualifications Authority (SAQA) accredited Higher Education Institution in South Africa.

Undergraduate student

An undergraduate student is a student who is studying certain courses in an attempt to obtain a first degree at a university (Oxford South African School Dictionary, 2010).

Undergraduate nursing programme

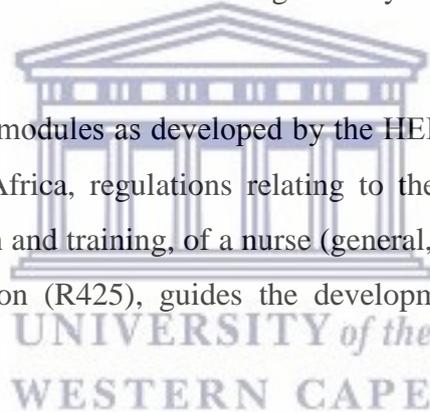
The undergraduate bachelor's degree in nursing is a four-year training programme leading to registration as a nurse (general, psychiatric and community) and midwife in South Africa as regulated by the South African Nursing Council (SANC), Regulation 425 of 1985. The undergraduate programme is offered in modules as guided by Regulation 425 of 1985 (SANC).

Modules

A programme is divided into modules as developed by the HEI. In an undergraduate bachelor's degree in nursing in South Africa, regulations relating to the approval of and the minimum requirements for the education and training, of a nurse (general, psychiatric and community) and midwife leading to registration (R425), guides the development of modules at a school of nursing.

Student nurse

A student nurse or learner nurse is a person undergoing education or training in nursing and who must apply to the South African Nursing Council to be registered as a learner nurse or a learner midwife. The Council must register any person who has complied with the prescribed conditions and has furnished the prescribed particulars for a training programme at a NEI (Nursing Act No. 33, 2005) as a learner nurse or a learner midwife. A student is a person who studies at a college or university (Oxford South African Pocket Dictionary, 2015). In this study, the student was a registered third-year undergraduate nursing student participating in an intervention to enhance the integration of theory and clinical practice (ITCP) of the ear, nose and throat (ENT) health assessment in the primary care and clinical skills module (PCCSM) through mobile learning in a undergraduate nursing programme.



Professional nurse (PN)

“A professional nurse is a person who is qualified and competent to independently practice comprehensive nursing in the manner and to the level prescribed and who is capable of assuming responsibility and accountability for such practice” (Nursing Act, No. 33 of 2005: Section 30). A professional nurse is a person registered as such in terms of section 31 of the Nursing Act (No. 33 of 2005). In this study lecturers and clinical facilitators were professional nurses.

Lecturer

This is a person who is employed to lecture or facilitate learning at a HEI. In this study a lecturer is an individual who facilitates a discipline specific module specific to the third year in a four-year undergraduate nursing programme.

Clinical Facilitator

This is a registered nurse who provides assistance, support and guidance to a learner nurse or a learner midwife in a clinical setting (Nursing Act, No. 33, 2005). In this study a clinical facilitator is an individual who facilitates discipline specific clinical teaching in clinical facilities in the third year in a four-year undergraduate nursing programme.

South African Nursing Council (SANC)

SANC refers to the statutory body that regulates the profession of nursing in South Africa in terms of the Nursing Act (No 33, 2005), as amended.

Diagnosing

“In these regulations, "the Act" shall mean the Nursing Act, 1978 (Act 50 of 1978), and any expression to which a meaning has been assigned in the Act shall bear such meaning, and, unless the context indicates otherwise, "diagnosing" shall mean the identification of and discrimination between physical, psychological and social signs and symptoms in man.”

Treatment

“In these regulations "the Act" shall mean the Nursing Act, 1978 (Act 50 of 1978), and any expression to which a meaning has been assigned in the Act shall bear such meaning, and, unless the context indicates otherwise, "treatment" shall mean the selection and performance of those

therapeutic measures essential to the effective execution and management of the nursing regimen.”

Client/patient

A client or patient refers to an individual seeking healthcare.

Plan

A plan is a structured outline of actions to be taken. In this study the plan outlined draft design principles to be followed to integrate theory and clinical practice of the ear, nose and throat health assessment.

Intervention/Enactment

This refers to an intentional action to amend, rectify or prevent harm to a patient or to improve the mental, emotional or psychological function of the patient (Blackwell’s Nursing Dictionary, 2005; Mosby’s Medical Dictionary, 2014). In this study the enactment phase will include the development of a plan for the intervention. The enactment phase thus includes the development of the plan and the intervention.

Enactment Phase

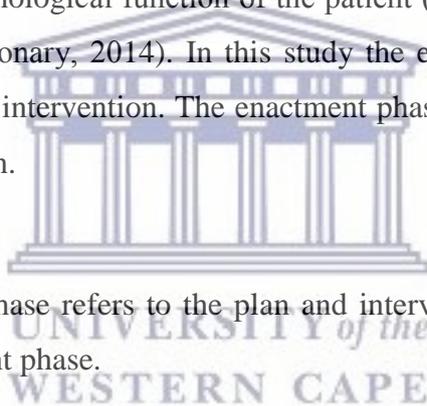
In this study the enactment phase refers to the plan and intervention (enactment) thus the two steps followed in the enactment phase.

Mobile learning (m-learning)

Koole, as cited in Kenny, Van Neste-Kenny, Park, Burton and Meiers (2009), states that m-learning is viewed as a result of the combination of mobile technologies, the capacity of human learning and social communication, interaction with the device, the learner and the societal aspects of learning.

Mobile devices

The term mobile devices are associated with wireless, small portable, handheld devices such as cellular phones, smartphones, personal digital assistants (PDAs), MP3 players, portable game devices, tablets, notebooks and laptops (Wagner, 2005; Kukulska-Hulme, 2005; Traxler, 2007).



WhatsApp

WhatsApp is a messenger application for smartphones. It is free to download and use the application. Data charges apply as you need Internet access to use the application.

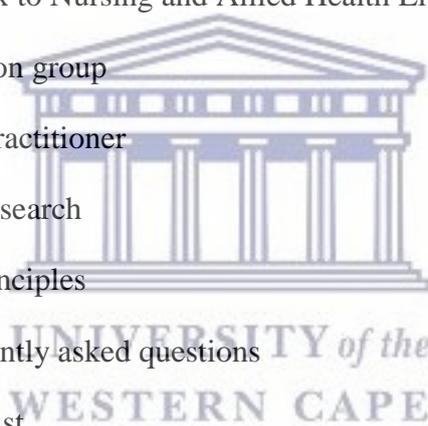
Affordances

An affordance is the possibilities for action offered by an object, technological device or programme.



ACRONYMS AND ABBREVIATIONS

AT	Activity Theory
BBM	blackberry messenger
BYOD	bring your own device
CBL	case-based learning
CDG	conceptualisation discussion group
CHAT	Cultural-Historical Activity Theory
CHC	community health centre
CHEC	Cape Higher Education Consortium
CINAHL	Computer Index to Nursing and Allied Health Literature
CG	conceptualisation group
CNP	clinical nurse practitioner
DBR	design-based research
DDP	draft design principles
DFAQ	dynamic frequently asked questions
EDL	essential drug list
EML	essential medicines list
ENT	ear, nose and throat
FG	focus group
FGD	focus group discussion
FGDs	focus group discussions
HE	higher education
HEI	higher education institution
HEIs	higher education institutions



HOD	head of department
HP	Hewlett-Packard
ITCP	the integration of theory and clinical practice
ICT	information and communications technology
ILDF	Integrative Learning Design Framework
ITU	International Telecommunication Union
ISSI	individual semi-structured interview
LCFG	lecturers and clinical facilitators focus group
LMS	Learning management system
MIM	Mobile instant messaging
MKO	More knowledgeable other
NEI	nursing education institution
NMC	New Media Consortium
NQF	National Qualification Framework
PACK	Practical Approach Care Kit
PAH	pedagogy – andragogy – heutagogy
PC	personal computer
PCCSM	primary care and clinical skills module
PDA	digital assistant
PHC	primary health care
PN	professional nurse
SANC	South African Nursing Council
SAQA	South African Qualifications Authority
SD	standard deviation



SFG	student focus group
STD	standard treatment guideline
SMS	short message system
SON	school of nursing
SPSS	Statistical Package for the Social Sciences
UNESCO	United Nations Educational, Scientific and Cultural Organisation
WCP	Western Cape Province
WCDOH	Western Cape Department of Health
WCDHF	Western Cape Department of Health Facilities
WMG	WhatsApp Messenger Group
ZPD	zone of proximal development



EMOTICONS EXPLAINED AND LINKED TO APPROPRIATE AFFORDANCES

EMOTICON	AFFORDANCES	INTERPRETATION
	Accessibility	Mobile devices afford access to individuals in real-time.
	Affordability	Using WhatsApp Messenger on a mobile device to communicate is affordable.
	Browse-ability	Mobile devices afford browsing the Internet.
	Combine-ability	WhatsApp Messenger on mobile devices allows the creation of groups which affords combine-ability.
	Draw-ability	To be able to capture drawings or to produce drawings using your mobile device
	Integrate-ability	The use of mobile devices to communicate could afford ITCP.
	Link-ability	Mobile devices afford a communication link between individuals.
	Listen-ability	Mobile devices allow listening to a conversation or to recorded messages.
	Move-ability	Mobile devices are portable and you can move around while using the device.
	Permission-ability	Permission to use mobile devices in health facilities is important to ensure confidentiality of patient information.
	Production-ability	The ability to produce videos using your mobile device.
	Readability	You are able to read text messages, books, etc. using your mobile device.
	Search-ability	Internet access on mobile devices affords searching for resources.
	Share-ability	WhatsApp Messenger affords the sharing of pictures, videos, etc.
	Speak-ability	Recording of voice notes is possible when using WhatsApp Messenger.
	Synchronicity	WhatsApp Messenger on mobile devices allows the dissemination of information to multiple people at the same time.

	Video production-ability	Mobile devices afford the production of videos.
	View-ability	Mobile devices afford looking at pictures, messages, notes, etc.
	Watch-ability	Mobile devices afford the watching of videos and movies.
	Write-ability	Mobile devices afford write-ability through typing.



1 CHAPTER: RATIONALE AND OVERVIEW OF THE RESEARCH STUDY

“If we teach today as we taught yesterday, we rob our children of tomorrow.”

John Dewey

1.1 INTRODUCTION AND RATIONALE

Higher education is in the midst of a transformative change cycle attributable to the technological advancement from stationary desktop computers to laptop computers to handheld devices, that have the ability to expand memory, store, retrieve and download data at any time or place (George, Davidson, Serapiglia, Barla & Thotakura, 2010; Siemens & Tittenberg, 2009; Sung, Chang & Liu, 2016). Teaching and learning at HEIs is therefore challenged by fundamental changes in response to global, technological and learning research trends (Siemens & Tittenberg, 2009). The mode of learning for students has evolved from being bound to a physical classroom to being a virtual learning experience (Nordin, Embi & Yunus, 2010).

Some basic principles of teaching and learning, including assessment, have survived in the midst of the implementation of various forms of innovative practices. The educator still performs a central function, but there has been a shift from providing information (“spoon feeding”) to facilitating or discussing and reflecting, thus developing the critical thinking skills of learners (Sharples, De Roock, Ferguson, Gaved, Herodotou, Koh, Kukulska-Hulme, Looi, McAndrew, Rienties, Weller & Wong, 2016).

The extension of learning, with the discovery of innovative techniques to initiate and embed learning, needs students to remain responsible and goal-orientated while enjoying their learning as an educational process. Innovating pedagogy may bring about less emphasis on the individual elements of instruction in future and rather increase the focus on how to merge new pedagogies into an effective process of lifelong learning (Sharples *et al.*, 2016).

In discussions with 78 experts to produce the NMC Horizon Report: 2017 Higher Education Edition, in partnership with the Educause Learning Initiative, two questions were posed:

- *Which trends and technology developments will drive educational change?*
- *What are the critical challenges and how can we strategise solutions?*

Mobile learning (m-learning) was emphasised as essential for the future of education (Adams-Becker, Cummins, Davis, Freeman, Hall, Giesinger & Ananthanarayanan, 2017:2).

Mobile technology affords a new dimension to the traditional face-to-face method of teaching, with the availability of online resources supported by virtual learning environments “while on the move” (Gupta & Koo, 2010; Nordin, Embi & Yunus, 2010; Park, Johnson, Vath, Kubitskey & Fishman, 2013). M-learning is defined as “learning with mobile devices”, and it has the potential to offer something innovative and distinctive to extend the philosophies of learning. Mobile devices have advanced from being a conventional tool for communication to an effective learning tool in higher education due to their exponential acceleration and variety of applications (Gupta & Koo, 2010). Kukulska-Hulme (2009:158) purports that “to a certain extent, by dint of their ubiquity, mobile devices are already influencing how people learn; so, teachers need to do more than just watch it happen”.

M-learning can no longer merely be perceived as e-learning on a mobile device, as it has the potential to be applied effectively in new educational methods, spaces and places (Leavoy, 2016). Previously, m-learning projects in the United Kingdom, Europe and Northern America attempted to import e-learning techniques to mobile platforms. The limitations of the mobile phone regarding such aspects as functionality, battery life and screen size became evident when compared to the functionality of computers (Traxler, 2011).

Williamson and Muckle (2018) identified the shift in paradigms at nursing schools with the integration of technology into the teaching and learning environment to create active and meaningful learning experiences for students. George *et al.* (2010) point out that the American Association of Colleges of Nursing, the National League for Nursing and the Institute of Medicine, which are major forces in professional health care and nursing education, all advocate the incorporation of mobile devices into nursing education for the integration of theory and practice. Handheld technological devices or a PDA, also known as a handheld personal computer (PC), were effectively incorporated into nursing education programmes and provided students with a rich resource of available and up-to-date reference material. Almost 80 percent of students who participated in the study of George *et al.* (2010) indicated that they used a PDA as an educational resource in both the classroom and the clinical environment.

The International Telecommunication Union in 2015 reported that, globally, there were more than seven billion mobile cellular subscriptions (www.itu.int). According to the 2013 census, there were 80 million active cell phone activations in South Africa in 2015 (its population count then being 52.98 million) (www.news24.com).

Muñoz-Reyes (2014:1) proposes that mobile devices offer a number of affordances (features) that can make learning “*fun, satisfying and rewarding*” including: **portability**, as mobile devices are small and some are the size of your palm; **user-friendliness**, as anyone can learn how to use the basic functions of a mobile device; and **durability**, as some devices are highly resistant to shock and dust and it is maintenance free, only needing recharging (www.wise-qatar.org). Applications available on mobile devices provide knowledge and resources in real-time with the continual influx of new information (Gupta & Koo, 2010). Mobile devices could essentially enhance a connection to the continuation of learning in real-time between formal (campus) and informal learning (clinical practice) spaces, while teaching the health assessment of the ear, nose and throat (ENT) in the primary care and clinical skills module (PCCSM) offered in an undergraduate nursing programme at a HEI in the WCP. Mobile devices could thus be used effectively in teaching and learning to develop creative thinkers and active, participatory problem-solvers (www.wise-qatar.org).

A m-learning plan/intervention for the purposes of this study was needed to bring about educational changes and to find solutions in a PCCSM that incorporates the ENT health assessment. The study was developed on the assumption that the features available on mobile devices might be applied to enhance the integration of the theory and clinical practice of the ENT health assessment in the PCCSM.

1.2 EMERGING M-LEARNING TECHNOLOGY

Kukulska-Hulme (2012:247) recognises that mobile devices are “popular everyday tools and services that are also potential or de facto resources for education”. The daily use of mobile devices has made them one of the most competitive influences in creating a meaningful, fun and entertaining learning environment for the integration of students’ learning. The creation of an effective learning environment, with visual and auditory stimulating learning activities, has the potential to draw the attention of students, encourage their motivation to learn and enhance their opportunities for independent learning and collaboration. It is necessary for the course content to

be designed to reflect an association to life experiences that supports students to identify the importance of learning (Liu & Chu, 2010). The fundamentals of mobile learning are the availability of mobile internet and mobile devices as this allows the individual to exhibit, store and distribute information as well as to network with others (de Witt & Gloerfeld, 2018).

Mobile devices can offer students “a vast library of global knowledge” at any time and at any place. Instead of banning the use of mobile devices in HEIs, these devices should rather play an essential part in the daily lives of young people, as their effective application has the potential to enhance teaching and learning (Altameem, 2011). A study by Khrisat and Mahmoud (2013) on the integration of the smart features on mobile devices, while teaching English as a foreign language, identified a transformation in learning by moving the learning environment from within the walls of the classroom setting to the open world through Internet access. A wealth of knowledge that can potentially be accessed on mobile devices thus extending the overall learning experiences of students (Khrisat & Mahmoud, 2013). It is of utmost importance that students are allowed to seek for more than the educator can provide within a classroom setting (Altameem, 2011). Schrøder and Petersen (2013:108) acknowledge that knowledge attainment is an informal process which is “authentic, personal, and situated”. Over the past decade, the m-learning community has established that m-learning could “enhance, extend and enrich the concept and activity of learning itself” (Traxler, 2011).

On 22 July 2016, new data on Internet usage was released by the ITU (UN specialised agency) for information and communication technology (ICT), indicating usage as follows: 81 percent in developed countries, compared with 40 percent in developing countries and 15 percent in the least developed countries. Houlin Zhao, ITU Secretary-General, stated that access to ICTs has the potential to serve as one of the major accelerators of the 2030 Agenda for Sustainable Development. Even with the expansion in global interconnectedness, more must be done to bridge the digital divide and to bring the more than half of the global population, who are currently not using the Internet, into the digital economy (www.itu.int). In 2016, the international community embarked on the implementation of the 17 Sustainable Development Goals (SDGs) and their 169 targets. Given the tremendous development of ICTs, ITU played a role in facilitating the attainment of the 17 SDGs and their 169 targets, according to Brahim Sanou, the Director of the ITU's Telecommunication Development Bureau (www.itu.int).

Half of the world's population was still offline by the end of 2016, which sadly supports the evidence that the digital divide still exists. It was also reported that 3.9 billion people, which is more than half of the world's population, have not used the Internet as yet. Evidence indicated that 84 percent of European households are connected to the Internet, while only 15.4 percent in African regions have access to the Internet, demonstrating the extent of the digital divide (www.itu.int). There is, however, comparative evidence that the almost one billion households in the world who have Internet access include 230 million in China, 60 million in India and 20 million in the world's 48 least developed countries (www.itu.int).

Castells (2012) identify the inequality in broadband access and educational gaps in the ability to operate in a digital culture with the increase in access to Internet and wireless communication. This tends to reproduce and amplify class, ethnic, race, age, and gender structures of social domination between countries and within countries (Castells, 2012).

In the early 2000s, there was a rapid expansion of m-learning in the health care of the United States of America. Software applications that became available for download by nurses included the Davis's Drug Guide for Nurses and Taber's Cyclopaedic Medical Dictionary (George *et al.*, 2010). In clinical courses in nursing practice, m-learning and the use of mobile devices have more recently indicated the potential to bring instructors, peers and resources together at the point-of-care to enhance students' safety and evidence-informed practice (Kenny, Van Neste-Kenny, Burton, Park & Qayyum, 2012). Kenny, Park, Van Neste-Kenny, Burton and Meiers (2009) and Park, Van Neste-Kenny, Burton and Kenny (2010) argue that m-learning could also be effective in supporting the teaching and learning of distance learning nursing students. This suggests that nursing students might be able to integrate their theory and their clinical practice of the ENT health assessment when an effective m-learning support system is put in place.

Fundamental changes in international curriculum design and delivery at HEIs regarding the use of appropriate emerging technology have provided students with opportunities to enhance their learning in the 21st century (Bates & Sangra, 2011). The global increase and availability and affordability of mobile devices have made them indispensable to day-to-day social networking. They are embraced by young people who experience a sense of ownership while engaging with the devices (Pachler, Bachmair & Cook, 2010).

In South Africa, the focus of the White Paper on Higher Education (2001:4) is on the “production, acquisition and application of new knowledge as national growth and competitiveness are dependent on continuous technological improvement and innovation, driven by a well-organised, vibrant research and development system which integrates the research and training capacity of higher education with the needs of industry and of social reconstruction” (Department of Education, 2001:4).

The need to strengthen electronic teaching (e-teaching); which includes teaching with mobile devices in higher education, alongside continuous technological and innovative improvements, has been identified as essential, specifically with regards to the new generation.

Naicker and Van der Merwe (2012) researched the technological readiness of students at a South African (SA) HEI, as technological improvements brought about constructive variations in the way that learning takes place. The accessibility of mobile applications for teaching and learning has afforded the benefit of academic support in HEIs. The research findings, however, identified one disadvantage in the use of m-learning applications within a South African context, namely that the data bundles required to advance effectively m-learning strategies were costly (Naicker & Van der Merwe, 2012).

1.3 MOBILE LEARNING IN THE CONTEXT OF THE WESTERN CAPE PROVINCE

M-learning is taking its place in the arena of higher education in the Western Cape. A study conducted at the University of Cape Town reported on an honours degree programme where students used the dynamic frequently asked questions (DFAQ) to consult with peers and lecturers. They used a special purpose web-based tool with a short message service (SMS) interface as their mode of communication. The study concluded that DFAQ facilitated access to bridge the gap between actual and potential development, stimulated knowledge sharing and peer learning, and impacted on the pedagogical designs of learning tasks (Ng’ambi & Goodman, 2009). The findings of a study by Pimmer, Brühlmann, Odetola, Dipeolu, Gröhbiel and Ajuwon (2018) on instant messaging and the clinical learning experience of nursing students' indicate that students are able to continue existing educational and professional interactions while using mobile instant messaging platforms.

Nursing programmes are written in line with the National Qualification Framework (NQF) that stipulates critical cross-field education and training outcomes for higher education programmes (Nkomo, 2000). These critical outcomes describe the qualities which the NQF identified for the curriculum development, for example for undergraduate programmes for nursing students in the higher education system. Nursing educators, including lecturers and clinical facilitators, incorporate the critical outcomes in the nursing programmes that inter alia stipulate the effective and critical use of technology (e.g. mobile technology), and show responsibility towards the environment and health of others (Nkomo, 2000). M-learning could therefore be used productively in nursing education, including the ENT health assessment in the PCCSM, to integrate theory and clinical practice.

The new 21st Century Graduate Attributes of the university where the research was conducted, set the goal of striving to ensure the enhancement of teaching and learning through innovation. The identified teaching and learning objectives of the university were to: enhance and promote the status of teaching and learning through innovative interventions; infuse technology into teaching and learning, promote the use of e-pedagogy; develop an infrastructure for teaching and learning using technology; and develop a more responsive teaching and learning environment that promotes and enhances flexible learning that aim to promote and support learning (Wenmoth, 2017). These objectives were developed to address students' learning needs, improve retention and throughput of students and ensure responsive teaching, learning programmes and practices. A study that explored the experiences of undergraduate nurse educators with e-learning, identified factors that influenced a blended learning approach aimed to engage student learning. The nurse educators identified that the blended learning approach, supporting face-to-face facilitation, provided flexibility, support and effective communication (D'Souza, Karkada & Castro, 2014).

The purpose of this current study is to describe and explore the affordances of m-learning in order to develop a plan for intervention to integrate the theory and clinical practice of the ENT health assessment in the PCCSM. It was assumed that m-learning could enhance the quality of teaching and learning in an undergraduate nursing programme at the HEI where the study took place. It was further assumed that m-learning could have the potential to play a significant role in collaborative knowledge sharing among students engaging with social learning methods, as some individuals communicate easier when not face-to-face.

1.4 TEACHING AND LEARNING APPROACHES AND PRACTICES IN MOBILE TECHNOLOGY

Scholars are faced with a wide variety of literature on the development of new technologies. The attention of researchers is drawn to web cyberspace, offering a diversity of data with different forms and simultaneity (Samadzadeh, Rigi & Ganjali, 2013). The pedagogical value of the use of mobile devices to enhance teaching and learning has increased at an exponential rate. There is thus a need to formally research how these devices can be used as effective tools to enhance the learning process in higher education, and more specifically, in an undergraduate nursing programme (Gupta & Koo, 2010).

M-learning adopts different teaching and learning methods to afford a constructive and engaging learning environment at an affordable cost to students, lecturers and clinical facilitators (Lim, Fadzil & Mansor, 2011). Mobile devices include smartphones, gaming consoles, media players, netbooks and handheld computers (Traxler, 2011). Most mobile phone users communicate using SMS due to affordability, especially those who cannot afford the high cost of cell phone calls (Leon, Schneider & Daviaud, 2012).

Handheld or mobile devices provide nurses with a reference library in their pockets. Depending on their Internet connectivity, nurses are able to search for drug formulas, textbooks or journal information on the latest evidence-based practices (George *et al.*, 2010). A study at University Sains Malaysia indicates that nursing students perceive m-learning via SMS as an easy, effective and useful study aid (Ismail, Johari & Idrus, 2010).

From a constructivist approach, learning is seen as an active process where students are motivated to be constructors of knowledge through using exploratory functions of mobile devices. A situated approach suggests that learning can be improved by ensuring that it takes place in an authentic context. Mobile devices can be used to enhance the learning activity, as they are well-suited to context-aware applications (Naismith, Lonsdale, Vavoula & Sharples, 2004). Evidence of the implementation of nursing programmes using mobile technology in clinical practice, classroom and laboratory settings identified concerns related to: cost; lack of information technology support; lack of faculty acceptance and role-modelling; lack of structured assignments and/or activities designed to encourage the implementation of mobile devices; and constraints on their use in clinical settings (Raman, 2015).

1.5 PROBLEM STATEMENT

The primary care and clinical module (PCCSM) is based on a comprehensive primary health care (PHC) approach that focuses on the well-being of the individual and communities. It promotes healthier lifestyles, the prevention of diseases and the rehabilitation of people after an injury or illness. The health assessment of the client is a fundamental skill and an essential competency which should be obtained within the undergraduate nursing curriculum, as identified within Regulation R425 of 22 February 1985 of the South African Nursing Council (SANC), as amended. The assessment of the patient provides baseline data, which is the foundation on which a nurse will base interventions, decisions and evaluations regarding the health of a client.

The need for research into the use of mobile devices in nursing education was identified at a university which is the focus of this study in 2011. The researcher facilitates a year level clinical feedback meeting at the HEI where she is working, where clinical facilitators indicated that their undergraduate nursing students were unable to integrate their theory and clinical practice of the ENT health assessment in the PCCSM.

It was highlighted in the meeting that students did not carry with them, their essential clinical module guides and textbooks (needed within the clinical environment) that guide and assist the achievement of their clinical outcomes. One reason given for this was that undergraduate nursing students find it challenging and sometimes impractical to “cart” clinical module guides and textbooks from an academic classroom or library environment to a “restricted” hospital or clinical environment. This environment furthermore has limited space for research within a hygienically clean or sterile clinical setting.

This indicated that there may be challenges that complicate the effective use of clinical module guides and textbooks as references in hospital wards, theatres, intensive care units, midwife obstetric units, clinics and community health centres. The clinical feedback from the meeting between the researcher and clinical facilitators emphasised the importance of finding innovative ways in which the students can be assisted to address this problem. Students need to have resource material available at any time or should be able to do research on conditions or procedures while off-campus and within the clinical field. This meeting thus motivated the need

to explore the introduction of mobile devices as an emerging technology in the undergraduate nursing programme at the university where this study was implemented.

Since 2010, the researcher has observed how students use different social media applications on their mobile devices for social networking or Internet research. However, mobile devices were not used to enhance the integration of theory and clinical practice (ITCP) of the ENT health assessment in the PCCSM at a school of nursing (SON) at the university where the study took place. The researcher therefore attended an emerging technology course offered by experts in mobile technology from HEIs in Cape Town in May and June 2012 to broaden her knowledge on integrating emerging technologies, specifically mobile technology, into the undergraduate nursing programme. Pachler, Bachmair and Cook (2010) emphasise that m-learning is a process of discovering how to use this technology successfully within the ever-changing learning environment in order to enhance the learning process. During attendance of the course on emerging technology, experts provided opportunities for participants to experience the application of mobile technologies at their respective HEIs.

The researcher shared the problem of integration of theory and practice in her field of interest with regard to a learning activity with a forum of people from the course on emerging technology, and the following questions were formulated:

- What is the extent of the knowledge of students, lecturers and clinical facilitators about mobile devices?
- What are the perceptions of students, lecturers and clinical facilitators on the affordances of m-learning with the integration of theory and practice, specifically regarding the ENT health assessment in the PCCSM in an undergraduate nursing programme at an HEI in the WCP?
- How can a plan/intervention be developed to integrate the theory and practice of the ENT health assessment in the PCCSM through m-learning in an undergraduate nursing programme?
- How can a plan developed for intervention be implemented to integrate mobile technology in the theory and practice of the ENT health assessment in the PCCSM through m-learning in an undergraduate nursing programme?

- What reflections do students, lecturers and clinical facilitators have regarding the implementation of the plan to integrate the theory and practice of the ENT health assessment in the PCCSM through m-learning in an undergraduate nursing programme?
- How can lecturers and clinical facilitators be supported to integrate theory and clinical practice of the ENT health assessment in the PCCSM through m-learning in an undergraduate nursing programme?

The researcher, a nurse educator facilitating the PCCSM at the HEI of this study, was fascinated by the potential of using mobile devices to enhance ITCP within undergraduate nursing. The effective use of innovative technological methods could not only facilitate learning and ensure ITCP but could also spike enthusiasm for m-learning in nursing education and improve the quality thereof. While studies have been conducted on the use of emerging technologies (e.g. mobile devices) to enhance teaching and learning experiences in higher education pedagogies, little has been written with regard to the perspectives of learners on these tools. The need was therefore identified to investigate students' experiences of using mobile devices in order to ascertain how these devices might be used to enhance student learning and ITCP of the ENT health assessment in a PCCSM.

1.6 PURPOSE OF THE STUDY

This research study set out to explore and describe the affordances of m-learning to inform the development of a plan/intervention to integrate theory and clinical practice of the ENT health assessment in the PCCSM in an undergraduate nursing programme at an HEI in the WCP.

1.7 OBJECTIVES OF THE STUDY

The objectives of this study were the following:

PHASE 1 (EXPLORATION/SITUATIONAL ANALYSIS)

Objective 1

To explore and describe the knowledge of students, lecturers and clinical facilitators on the affordances of mobile devices for teaching and learning.

Objective 2

To explore and describe the perceptions of students, lecturers and clinical facilitators on ITCP of the ENT health assessment in the PCCSM through m-learning.

PHASE 2 (ENACTMENT)**Objective 3**

To develop a plan for the intervention for the ITCP of the ENT health assessment in the PCCSM through m-learning.

Objective 4

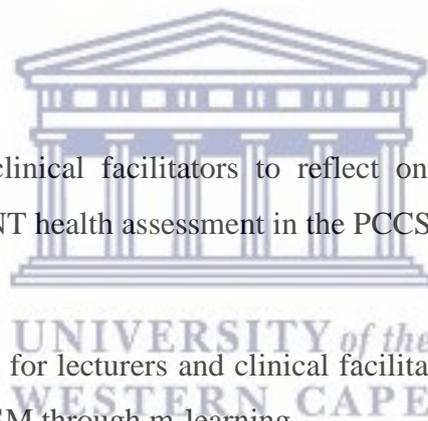
To implement the plan developed for intervention with students, lecturers and clinical facilitators to ITCP of the ENT health assessment in the PCCSM through m-learning.

PHASE 3 (EVALUATION)**Objective 5**

For students, lecturers and clinical facilitators to reflect on the three iterations during the intervention to ITCP of the ENT health assessment in the PCCSM through m-learning.

Objective 6

To describe recommendations for lecturers and clinical facilitators on how to ITCP of the ENT health assessment in the PCCSM through m-learning.

**1.8 CENTRAL THEORETICAL STATEMENT**

A mobile learning enactment has the potential to enhance ITCP of the ENT health assessment in the PCCSM in an undergraduate nursing programme.

1.9 PARADIGMATIC ASSUMPTIONS OF THE STUDY

A paradigm can be delineated as the authentic epistemological, ontological and methodological premises of the researcher (Babbie, 2010). A paradigm is a set of mutually accepted convictions that shape what we see and how we understand it, and how we view reality, and provides a framework for scientific practice.

Kuhn (1970:42) describes a paradigm as "universally recognised scientific achievements that, for a time, provide model problems and solutions for a community of researchers". Creswell (2014:32) describes a paradigm as a "worldview" or as a framework of ideas and beliefs through which the individual gains an understanding of the world and interacts with it. Guba and Lincoln (1994:105) define a paradigm or worldview as "a basic set of beliefs that guide action". In this study the meta-theoretical, theoretical and methodological assumptions are "integrated into the paradigmatic perspective" (Botma, Greef, Mulaudzi & Wright, 2010:187).

Meta-theoretical assumptions

The research study was guided by a particular philosophical stance that developed cognition and understanding of how to integrate mobile devices in teaching and learning, facilitated by the researcher, with experts, peers and participants through dialogue, socialisation and collaboration. A philosophy directs the method in which data is collected and how the data is interpreted (Burns & Grove, 2017). Brink, van der Walt and van Rensburg (2017) direct the underlying meta-theoretical assumptions for the study with regard to the key concepts of nursing theory (person, health, environment, action) being:

Person

A person was the 3rd year student who is a unique, holistic being with a body, spirit and mind. During learning, the student interacts with the environment with other persons, the lecturer (classroom and clinical practice) and clinical facilitator (clinical practice). In this study, it was assumed that a person in an HEI had access to mobile technology.

Health (learning)

Health is a dynamic interactive process between the student, lecturer and clinical facilitator in the learning environment. It was assumed that interaction could contribute to ITCP and that learning could be enhanced through the use of mobile devices during the 3rd year of an undergraduate programme.

Environment

The environment had an internal and external dimension. The internal environment refers to the body, mind and spiritual dimensions of the student, while the external environment consists of physical, social and spiritual dimensions in the context of a learning environment. The physical

dimensions refer to the physical structures in the external environment of the student. When dealing with the social aspect, the human resources in the external environment of the student were important to consider. Spiritual dimensions refer to the values and religious aspects in the external environment of the student.

Action (use of mobile device)

In health care, there has been a shift in clinical care from a hospital to a community-based environment that requires students, lecturers and clinical facilitators to focus on new approaches and tools to support their teaching and learning in diverse practice environments where resources are not readily accessible (Kenny *et al.*, 2009). In this study, it was assumed that:

- Mobile devices could be used interactively among students, lecturers and clinical facilitators in a manner that could enhance off-campus educational activities and could indirectly, positively influence classroom and on-campus teaching and learning experiences (Kukulska-Hulme, 2005).
- Mobile devices have the ability to provide a support network to learning “any time” or “anywhere” by ensuring collaboration among students, lecturers and clinical facilitators, irrespective of their various settings (Bennett, Maton & Kervin, 2008; Liu, Wang, Liang, Chan, Ko & Yang, 2003).
- M-learning incorporated into various clinical teaching approaches could enhance learning (Bennett, Maton & Kervin, 2008; Liu, et al., 2003).

1.9.1 Theoretical Assumptions

Certain assumptions emanating from the social constructivist learning theory of Vygotsky (1896–1934) supported this study. These assumptions are discussed below.

1.9.1.1 Social constructivism

The research conducted by the researcher was set on the foundation of the social constructivist theory of Vygotsky (1978). Social constructivism enhances learning through the creation of social interaction supported by situated, authentic, flexible and blended learning approaches. Social constructivism theorises how people construct knowledge socially. Vygotsky (1978) assumes that learning could not be disconnected from the social context in which the learner

found him/herself. Constructivist theorists, including Vygotsky (1978), view the construction of knowledge as occurring within learners during social interaction, emphasising that the socio-cultural context in which learning takes place is important (Danesh, Bailey & Whisenand, 2015; Huang, 2002). Conole, Dyke, Oliver and Seale (2004) propose an approach of supporting and enabling theory-informed design. This could be done through mapping and alignment of learning theories by outlining the features of theories in a way that scaffolds users' interaction with these ideas; in addition, representation of this process using the model provides an opportunity to make the relationship between the theory and clinical practice of the health assessment more obvious.

Every function in the child's cultural development appears twice: first, on the social level, and later, on the individual level; first, between people and then inside the child. This applies equally to voluntary attention, to logical memory, and to the formation of concepts. All the higher functions originate as actual relationships between individuals (Vygotsky, 1978:57).

Vygotsky theorises (1978) that the potential for cognitive development depends upon the "zone of proximal development". This is a level of development achieved when children engage in social behaviour. The full development of the "zone of proximal development" is dependent on full social interaction that can be developed with adult guidance or peer collaboration. Vygotsky's theory (1962) implies that learning takes place through interactions between students with their peers, teachers with students where they promote learning through discussion, collaboration, and feedback and collaboration with other experts on real-world problems or tasks that build on each person's language, skills and experience (Vygotsky, 1978).

... the constructivist approach means learning how, when and to what extend the studied experience is embedded in larger and often hidden, positions, networks, situations and relationships (Charmaz, 2006:130).

Vygotsky (1978) and Dewey (1998) assume that learners do not learn in isolation from others and recognise that people naturally learn and work collaboratively in their lives (Petraglia, 1998). The importance of the learner-learner, learner-instructor, learner-interface, instructor-interface, and learner-content interactions must be considered during the development of an

online course as an important aspect of the pedagogical experience and the ability of students to learn and understand. It is important to acknowledge that not all learners may actively engage in an online interaction using technology and instructors would need to assist learners to identify and to build on active and passive participative group discussion (Danesh, Bailey & Whisenand, 2015; Huang, 2002).

An effective educator should create a safe environment which could be flexible and blended to allow learners to freely express themselves, to share their ideas and to ask questions in a manner appropriate in tertiary institutions (Hamilton & Tee, 2013). A constructivist-based learning environment offers students the freedom to identify, select and arrange their learning processes which enhances critical thinking with other learners, while the educator acts as a facilitator. The online instructor from a constructivist approach has the responsibility to monitor and evaluate the quality of learning and peer group discussions within the online environment. The instructor has to build in adequate support, directions and guidelines for online learners (Huang, 2002; Westera, 1999; Zain, Rasidi & Abidin, 2012).

This research study was designed to explore and describe the affordances of m-learning to inform the implementation of a plan, by interactions between students and their peers, lecturers and clinical facilitators with students while promoting learning on the ENT health assessment through using WhatsApp discussions, feedback and collaboration with other experts. The research paradigm, the social constructivist theory of Vygotsky (1978), means that learning is enhanced through the creation of social interaction supported by situated, authentic, flexible and blended learning approaches.

Vygotsky (1978) believed that social interaction plays an important role in the cognitive development of the student, and that the focus should not fall on the student as an isolated or autonomous individual, but on the student as a product of his/her dynamic social interaction (Vygotsky, 1978). His work indicates that social interaction plays an important role in the development of cognition, reasoning or understanding. In this study it was assumed that:

- Education should allow students to be actively involved in their educational journey, and not merely be passive participants, as is the case with traditional educational methods (Hugg & Wurdinger, 2007; Nasri, 2017).

- Technology-based teaching and learning can be a method of instruction that could lead to a dynamic learning environment (Ghavifekr & Rosdy, 2015; Pitler, Hubbell, Kuhn & Malenoski, 2007).
- Mobile devices, such as mobile phones, could become a learning tool with great potential providing lecturers and clinical facilitators (as educators) with comprehensive learning opportunities that could accommodate the different learning needs and capabilities of individual students (Pitler *et al.*, 2007; Sung *et al.*, 2016).

According to the social constructivist theory of Vygotsky (1978), learning is enhanced by creating social interaction in teaching and learning (Figure 1.1).

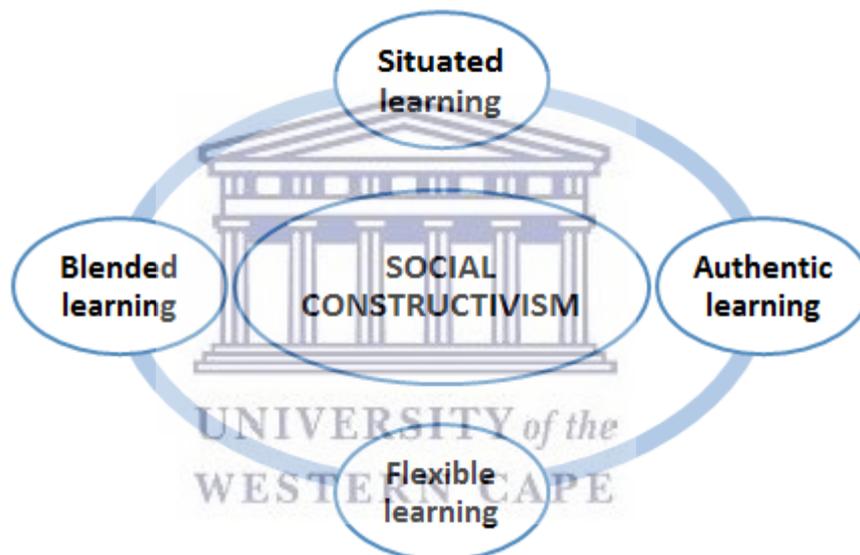


Figure 1.1: Theoretical assumptions of Social Constructivism

Each of the components in Figure 1.1 will be described.

1.9.1.2 Situated learning

Situated learning is generally an unintentional rather than a deliberate intervention or action. Social interaction is an important element of situated learning, as students become actively involved in a "community of practice", which represents certain shared beliefs and behaviours that are formed in the process of skill and knowledge acquisition. Situated learning theorists Brown, Collins and Duguid (1989) explain that cognitive apprenticeship supports learning in an

area by enabling students to acquire, develop and use cognitive tools in authentic domain activity (www.instructionaldesign.org).

In this study, the following assumptions regarding the introduction of mobile learning were made:

- There should be an intentional plan developed for an intervention or activity to enhance ITCP of the ENT health assessment in the PCCSM.
- Social interaction is important for students' active involvement in a "community of practice", whereby ITCP of the ENT health assessment in the PCCSM is enhanced.
- Cognitive apprenticeship should be promoted to support learning and enhance ITCP of the health assessment in the PCCSM.

Social constructivism (Vygotsky, 1978) enhances learning by creating social interaction, and it was assumed that it could lead to:

- an authentic learning platform that facilitates the ability to create, innovate and communicate the ENT health assessment in the PCCSM;
- a flexible learning platform that allows students the choice about where, when and how learning about the ENT health assessment in the PCCSM would occur;
- a blended learning environment through a combination of face-to-face and online learning experiences, with theory sessions on-campus and m-learning interventions when at clinical practice facilities; and
- a situated learning experience which enables students to acquire, develop and use their cognitive tools within authentic domain activity to enhance the integration of their theory and clinical practice of the ENT health assessment in the PCCSM.

1.9.1.3 Authentic learning

Employers and government funders of graduates are increasingly experiencing that university outcomes are not aligned with the needs of the dynamic and shifting labour force. Graduates should be able to create, innovate and communicate in their field of speciality. The increased impact of constructivism as a philosophical approach to learning, prompted many educators at

universities to implement more “authentic” teaching and learning environments (Herrington, Reeves & Oliver, 2014). In this study, it was assumed that:

- by focusing on an authentic learning approach, beneficial learning opportunities for students could be created that can be drawn upon once students leave the learning institution (Herrington, Reeves & Oliver, 2014);
- students and lecturers and clinical facilitators could engage in innovative and realistic tasks that affords opportunities for complex, collaborative actions for authentic learning; and
- the researcher, lecturers and clinical facilitators could provide guidance and resources to ensure that the authentic task is well supported and that learning can take place (Herrington, Reeves & Oliver, 2014).

1.9.1.4 Flexible learning

Learning is an intricate practice that is reliant on the ability of the students to re-contextualise the knowledge and skills acquired. Flexible learning is a set of educational philosophies and systems concerned with providing learners with increased choice, convenience and personalisation. In particular, flexible learning provides learners with choices about where, when and how learning occurs (Gordon, 2014; Shurville, O’Grady & Mayall, 2008). In this study, it was assumed that the introduction of mobile device could:

- provide an adaptable or flexible approach to learning where students have a user-friendly content and interaction centred approach around their learning process (Gordon, 2014);
- provide students with increased choice, convenience and personalisation suitable to them (Kukulka-Hulme, 2016; Shurville, O’Grady & Mayall, 2008);
- provide students with the opportunity to learn in accordance with their needs, time and available resources (Kukulka-Hulme, 2016); and
- familiarise students with a wide range of concepts when ITCP of the ENT health assessment to demonstrate their critical insights (Lee, Parsons, Kwon, Kim, Petrova, Jeong & Ryu, 2016).

1.9.1.5 Blended learning

Blended learning can be defined as a combination of face-to-face and online learning experiences. It is important that both forms of learning (and their respective strengths) are optimally integrated in the learning experience (Garrison & Vaughan, 2008).

In this study, it was assumed that the introduction of mobile devices can enhance a m-learning intervention in the following ways:

- Thoughtful interaction with face-to-face and online learning could enhance ITCP of the ENT health assessment in the PCCSM.
- Fundamental rethinking of the course design could optimise student engagement and enhance ITCP of the ENT health assessment in the PCCSM.
- Teaching and learning using mobile devices could restructure and replace traditional class contact hours to enhance ITCP of the ENT health assessment in the PCCSM.

1.9.2 Methodological Assumptions

1.9.2.1 Design-based research

The three phases of the Integrative Learning Design Framework (ILDF) of Dabbagh and Bannan-Ritland (2005), a design-based methodological framework, were used in this study, which included the exploration phase, the enactment phase and the evaluation phase. The ILDF was used for the systematic development of an online learning support for students while doing the ENT health assessment in the PCCSM during the 3rd year undergraduate nursing programme.

The assumptions of this approach for this study were as follows:

- The elements of quantitative and qualitative research approaches could ascertain the extent and complexity that students, lecturers and clinical facilitators understand and validate the integration of mobile devices in undergraduate nursing to enhance teaching and learning (Creswell & Plano Clark, 2010).
- Students, lecturers and clinical facilitators could participate in or contribute to the description of recommendations on how to integrate theory and clinical practice of the

ENT health assessment in the PCCSM through m-learning, even though they were not specialists in instructional design (Dabbagh & Bannan-Ritland, 2005).

- The knowledge gained by the researcher in the exploration of perspectives on learning (by enacting specific instructional strategies and learning from the results) could promote the development of effective instruction in undergraduate nursing programmes (Dabbagh & Bannan-Ritland, 2005).

The enactment phase of the ILDF of Dabbagh and Bannan-Ritland (2005) was supported by the activity theory (AT) of Engeström (2008) as a framework to systematically explore and evaluate the enactment through the components of the activity system.

1.9.2.2 Activity Theory System of Engeström (2008)

This research study is based on the Activity Theory (AT) of Engeström (2008), which is based on the Cultural-Historical Activity Theory (CHAT) which builds on the work of Vygotsky (1978). It was used in this study to examine the human interactions of students, lecturers and clinical facilitators during the online m-learning enactment. Hardman (2005) identifies the strength of AT as enabling an understanding of learning as a result of tool-mediated interactions. Hardman (2005) describes the AT as a way to analyse an activity system. The activity system refers to a group of people or a community such as students who share a collective objective and use tools to act on the collective object and enable transformation. The concept of AT focuses on complex interrelations between the individual subject (integration of ENT health assessment) and his or her community (students) (Engeström, 2001). The AT is described in Chapter 2.

1.9.2.3 Affordances of Bower (2008)

This research study integrated the affordances of Bower (2008) with the appropriate learning technologies by looking at the action potential of the technology. The affordances of Bower (2008) are described in Chapter 3.

1.10 RESEARCH SETTING

This study took place respectively during a semester in 2013 (exploratory phase) and in 2016 (enactment phase). It involved the third-year level, undergraduate community health nursing programme presented by a school of nursing at a university where the study was conducted.

1.11 RESEARCH DESIGN OF THE STUDY

The methodological design-based research framework, the ILDF of Dabbagh and Bannan-Ritland (2005), by utilising quantitative and qualitative research methods, allowed the researcher to complete a structured participative investigation into the phenomena as described in the three phases, namely the exploration, enactment and evaluation phases as illustrated in Table 1.1.

Table 1.1: ILDF phases (Dabbagh & Bannan-Ritland, 2005)

ILDF phases		Study objectives
Phase 1	Exploration (Situational analysis)	<i>Objective 1:</i> To explore and describe the knowledge of students, lecturers and clinical facilitators on the affordances of mobile devices for teaching and learning.
		<i>Objective 2:</i> To explore and describe the perceptions of students, lecturers and clinical facilitators on ITCP of the ENT health assessment in the PCCSM through m-learning.
Phase 2	Enactment	<i>Objective 3:</i> To develop a plan for the intervention for the ITCP of the ENT health assessment in the PCCSM through m-learning.
		<i>Objective 4:</i> To implement the plan developed for intervention to ITCP of the ENT health assessment in the PCCSM through m-learning.
Phase 3	Evaluation	<i>Objective 5:</i> For students, lecturers and clinical facilitators to reflect on their experiences during three iterations in the intervention to ITCP of the ENT health assessment in the PCCSM through m-learning.
		<i>Objective 6:</i> To describe recommendations for lecturers and clinical facilitators on how to ITCP of the ENT health assessment in the PCCSM through m-learning.

1.11.1 Phase 1: The exploration phase (situational analysis)

Phase 1 consisted of a quantitative (Objective 1) and a qualitative phase (Objective 2). A literature review on the accessibility of m-learning was the first part of the exploration phase.

1.11.1.1 Phase 1: Quantitative phase

Objective 1:

To explore and describe the knowledge of students, lecturers and clinical facilitators on the affordances of mobile devices for teaching and learning.

Research design

A quantitative, exploratory, descriptive research design method was followed to investigate the participants' level of knowledge about and use of the phenomena (mobile devices) (Creswell & Plano Clark, 2011). In quantitative research, the focus is on using structured procedures and formal instruments to collect numeric information, which is then analysed using statistical processes (Brink *et al.*, 2017).

Study population

The study population refers to a group of individuals who have similar characteristics. There has to be some form of commonality, or shared characteristic or attribute among this group of individuals. The accessible population included all third-year undergraduate nursing students (N=114) registered for the ENT health assessment in the PCCSM (a semester module), as well as the lecturers and clinical facilitators (N=6) involved in facilitating this module in an undergraduate nursing programme at an HEI in the WCP.

Sampling and sample

Sampling involved the population selected to participate in a specific research study to generate an understanding of their perceptions (De Vos, Strydom, Fouché & Delpont, 2011). Participants who volunteered to participate in the study were included in the sample as they were all accessible (Banerjee & Chaudhury, 2010; Hek, Judd & Moule, 2002). The focus of probability sampling in quantitative research is on selecting a large number of the representative study population or those who represented a segment of the study population. Participants (n=84) who met the eligibility criteria served as the sample:

Eligibility criteria

Participants (students, lecturers and clinical facilitators) had to:

- be in possession of a mobile device;
- have at least six months of technical exposure in the use of a mobile device;
- be prepared to use their personal mobile device as a tool to take part in the study; and
- have access to a reliable Internet or data bundles connection off-campus.

Data collection method

Data was collected by means of an electronic survey using a questionnaire. The purpose of a questionnaire is to expose each respondent to the same questions at the same time to ensure that the differences in their responses to questions can be interpreted as reflecting differences among the respondents (Siniscalco & Auriat, 2005). An instrument (questionnaire) was developed based on a literature review on mobile devices; the principles of affordances (Bower, 2008) and pedagogical and instructional models (Chapter 2). The purpose of the literature review was to provide a background on mobile technology within a higher education environment.

Pre-testing of the instrument

Pre-testing was done to ensure face, content validity and reliability of the instrument. The purpose of conducting a pre-test of the questionnaire or survey is to enable adjustments to the final design according to the results (Siniscalco & Auriat, 2005). The pre-testing was done on a number of participants who met the inclusion criteria (Botma *et al.*, 2010). Ten (n=10) registered third-year undergraduate nursing students who had completed the ENT health assessment in the PCCSM, one lecturer and one clinical facilitator in the third year participated in the pre-testing of the instrument. Some comments were made and the instrument was adjusted accordingly. The lecturer and clinical facilitator who participated in the pre-testing of the instrument did not participate in the main study. Five field experts in emerging technology also reviewed the instrument to ensure face and content validity. The survey was accompanied by a letter to inform participants of the project and a consent form indicating their willingness to participate in the study.

Data analysis

Descriptive statistics described the basic features of data, providing simple summaries of the sample and measures. Data of a number of different variables (frequencies, mean values, standard deviations) was presented in tables and figures to facilitate the understanding thereof (Fisher & Marshall, 2009; Watson, McKenna, Cowman & Keady, 2008).

Validity and reliability

Content validity is an assessment of the extent to which the instrument embodies all the different components of the phenomena to be measured. The content of the instrument was based on a

literature review on the topic, which revealed essential aspects of the phenomena to be included in the instrument (Brink *et al.*, 2017).

Face validity showed that the instrument appears to measure what it was intended to measure (Brink *et al.*, 2017). The instrument was pre-tested and given to five experts in the field of mobile technology. An expert in the field of primary care and clinical skills also looked at the instrument to ensure face and content validity.

The validity of the instrument was enhanced by ensuring that the questions asked were relevant to the participants in the study and that relevant questions and scales were understood.

1.11.1.2 Phase 1: Qualitative phase

Objective 2:

To explore and describe the perceptions of students, lecturers and clinical facilitators on ITCP of the ENT health assessment in the PCCSM through m-learning.

Design

Rubin and Babbie (2011) inform that qualitative descriptive research provides rich data about the phenomena, environment and interactions of everyday life. The ENT health assessment in the PCCSM is offered in an undergraduate nursing programme at a HEI in the WCP.

Through an exploratory design, the perceptions of the participants were investigated to provide insight into the phenomenon to inform the intervention of the ENT health assessment in the PCCSM. The exploration was done through focus groups and individual interviews with students, as well as one focus group, individual interviews and a conceptualisation discussion group with lecturers and clinical facilitators. Through a descriptive design, rich data was gathered about the perceptions of participants on the phenomenon of mobile learning.

Study population and sample

Patton (2002) states that there are no rules for a sample size in qualitative research. In this qualitative study, the researcher focused on an accessible population and therefore used purposive sampling. The accessible population was the same participants of Phase 1. With purposive or selective sampling, a type of non-probability sampling, the researcher makes a

conscious selection of participants representing the phenomena being studied (Patton, 2002; (Brink *et al.*, 2017).

Preparation workshop

A curriculum informative workshop facilitated by the researcher was attended by students, lecturers and clinical facilitators, informing them about the use of m-learning to enhance ITCP of the ENT health assessment in the PCCSM. The aim was to shape how the same curriculum and content in the third-year level on the ENT would be offered in a mobile learning environment. The workshop included a technical presentation on the use of the various applications identified to inform all the participants on the effective use of the various applications on their mobile devices applicable to the study.

Data collection

Qualitative data on how to ITCP of the ENT health assessment through m-learning was collected through a workshop, focus groups, individual interviews, field notes and observational notes. An attempt was therefore made to collate an accurate exploration and description on the research problem identified without manipulating the data obtained (Yin, 2009). The complexity of the phenomena of interest and a thick, rich description of the many variables regarding the phenomena were considered as important (Hancock & Algozzine, 2011; Rule & John, 2011).

Qualitative data was collected from participants (students, lecturers and clinical facilitators) on the premises of a university where the study was conducted. Firstly, the information session and the signing of consent forms were done by fieldworkers (experts in qualitative research) in a lecture theatre that was big enough to accommodate all participants comfortably. The fieldworkers then arranged times and place where interviews could be conducted.

The focus groups and individual interviews were conducted in a smaller well-ventilated and illuminated room with six to eight chairs in a circular format to accommodate small groups. There was a small table to place the digital recorder and to take observational notes. The researcher conducted the focus groups and interviews and an independent master's student assisted with the collation of field notes to complement the digitally recorded interviews throughout the discussions and monitoring of the digital recorder. In design-based research the researcher is part of the data gathering to elicit design principles (Shattuck & Anderson, 2013).

The time allocated for the focus group sessions were a maximum of two hours and 45 minutes to 60 minutes was allocated for every individual interview (Sutton & Austin, 2015).

Focus groups

Focus groups are interviews with groups of five to 15 people who have analogous opinions and experiences (Brink *et al.*, 2017). Focus groups were scheduled with students, lecturers and clinical facilitators and sessions lasted at least one hour. Four focus group sessions were conducted with students and there were six students per focus group. One focus group was conducted with lecturers and clinical facilitators with five participants in the group.

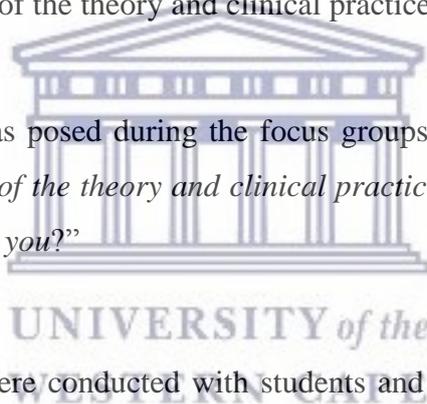
It was important that the researcher clarified the aims of the focus group with participants prior to the meeting. Focus groups were conducted with groups of six to 10 participants, depending on the size of the individual groups (students and lecturers and clinical facilitators). Participants' perceptions on the integration of the theory and clinical practice of the ENT health, informed the intervention.

The research question that was posed during the focus groups in this phase of the exploration was: *“What is the integration of the theory and clinical practice in the teaching and learning of the ENT health assessment for you?”*

Individual interviews

Eight individual interviews were conducted with students and three with lecturers and clinical facilitators to inform a plan for an intervention to integrate theory and clinical practice of the ENT health assessment through m-learning with students, lecturers and clinical facilitators (Rule & John, 2011; Yin, 2009). Individual interviews were conducted to collate data from participants, as they provided detail on issues raised during focus groups. This also provided a one-on-one sharing opportunity in a comfortable environment to participants who were not comfortable with sharing their thoughts in a group setting (Creswell & Plano Clark, 2010).

Qualitative data collection was continued until saturation was reached (when no new or relevant data emerged). Themes and sub-themes were developed and the findings were representative in terms of their properties and to the extent that validation could be confirmed. The relationships between the themes and sub-themes were well established and confirmed by the researcher and an independent coder (Bryman, 2016; Kumar, 2005; Strauss & Corbin, 1998).



Data analysis

A systematic data analysis was done, guided by Tesch's (1990) method (Creswell, 2013). The thematic analysis was used to analyse the data, with the intent to identify the major themes and sub-themes and use them to guide the development of a plan for intervention. Literature supported the results of the qualitative phase. An independent coder was approached to review data and confirm the themes and sub-themes identified by the researcher (Polit & Beck, 2018).

Trustworthiness

Lincoln and Guba (1985) draw a distinction between trustworthiness in qualitative research and reliability and validity in quantitative research and suggest four criteria for developing trustworthiness in qualitative inquiry namely credibility, dependability, confirmability and transferability (Polit & Beck, 2018).

Credibility

Certain techniques have to be adhered to when ensuring credibility in qualitative research. The researcher *had to remain* in the field of study over an extended period and use various data collection methods to ensure triangulation. Preventing misinterpretation of the view of the research participants should be combated, therefore there has to be a process to verify and validate the researcher's' interpretation and conclusions based on the data collected from the research participants (Brink *et al.*, 2017). **Credibility** was thus achieved through extended engagement of the researcher with participants after focus groups and individual interviews for clarification of data interpretation. Credibility was further established with a consensus meeting of the researcher with an independent coder on the accuracy of themes and categories interpreted from the data. The same research question was posed to all participants.

Dependability refers to the stability of the data over a period of time. This implied that, should a research question be repeated with the same or similar participants in the same or similar context, the expectation is that the results should be more or less the same. The researcher left an "audit trail" to ensure dependability should the need arise to verify data at any stage of the data analysis process (Tappen, 2011).

Shenton (2004) indicate that **confirmability** is the qualitative researcher's ability to ensure that objectivity of the study was maintained. Steps must be in place to ensure that the research

findings result from the research participants' rather than the views of the researcher. The role of triangulation in promoting confirmability reduces the incidence investigator bias (Shenton, 2004). The purpose of triangulation in qualitative research is to improve the validity and reliability of the research findings (Mathison, 1988). The use of triangulation strengthened the research study by using both quantitative and qualitative research approaches (Patton, 2002). Data triangulation with use of multiple data sources was used during data analysis. Writing field notes in the form of observational notes were taken during the interview and discussion group sessions (Polit & Beck, 2018).

The researcher conducted the focus group sessions and individual interviews. Confirmability was further established through the assistance of a postgraduate student who captured the observational and field notes during the sessions. An independent coder was approached to check the accuracy of themes and interpretation thereof before they were included in the study.

Transferability

This refers to the degree to which the findings of the study could be appropriate for another group or setting. The researcher had the responsibility to provide enough descriptive data to place users of the research in a position to evaluate how relevant the data would be within another context. A rich description of the participants, research setting, focus groups and individual interviews, including a final discussion group with lecturers and clinical facilitators, was done in an attempt to inform evidence-based practice (Polit & Beck, 2018).

The participants in this study were granted an opportunity to review the researcher's understanding of the data collected and transcribed in order to contribute towards the trustworthiness of this study. The researcher made an explicit attempt to capture the perceptions of the participants through a process by which themes were identified from the transcribed interviews of focus groups during the data analysis process. An independent coder was approached to identify themes in order to establish consensus in the thematic analyses of the research findings (Polit & Beck, 2018).

1.11.2 Phase 2: The Enactment

Objective 3: Developing a plan

To develop a plan for the intervention for the ITCP of the ENT health assessment in the PCCSM through m-learning.

This phase was informed by triangulation of findings from the literature review (Chapter 3), data from the survey (Chapter 4) and interviews (Chapter 5) with students, lecturers and clinical facilitators on ITCP of the ENT health assessment in the PCCSM. A plan emerged with principles for guiding the intervention and describing the implementation of the intervention. A description of the intervention according to the ILDF of Dabbagh and Bannan-Ritland (2005) was conducted.

Objective 4: Implementation of the plan

To implement the plan developed for intervention with students, lecturers and clinical facilitators to ITCP of the ENT health assessment in the PCCSM through m-learning.

During the intervention with students, lecturers and clinical facilitators the ITCP of third-year undergraduate nursing students using m-learning were explored by means of three iterative cycles. Methods during the intervention included a review of prior knowledge, problem solving activities, content of the PCCSM and the development of collaborative work skills through group activities within clinical practice on the module. WhatsApp Messenger discussions were used.

1.11.3 Phase 3: Evaluation through reflection

Objective 5

For students, lecturers and clinical facilitators to reflect on their experiences during three iterations in the intervention to ITCP of the ENT health assessment in the PCCSM through m-learning.

Objective 6

To describe recommendations for lecturers and clinical facilitators on how to ITCP of the ENT health assessment in the PCCSM through m-learning.

During this phase, an evaluation of the reflections (Objectives 5 and 6) of participants on the designed intervention to determine the affordances of m-learning for an undergraduate nursing program was made. Focus groups were held with students, lecturers and clinical facilitators which reflected how they experienced the intervention. The reflections were based on the ICT tool selected, the teaching and learning challenges identified in the pedagogical and instructional model and strategies (Chapter 7). The following question was asked to start the conversation: *“How was the intervention for you?”*

The outcome of this research study was the recommendations by the researcher, which include lessons learned on how to integrate m-learning into the undergraduate nursing curriculum. The following is a summary of the research phases outlined in Table 1.2.

Phase 1: The exploration phase is an analysis of practical problems experienced by participants (Dabbagh & Bannan-Ritland, 2005).

Phase 2: The enactment phase is the iterative cycles of testing and refinement of solutions in practice (Dabbagh & Bannan-Ritland, 2005).

Phase 3: This phase comprises an evaluation through reflection (Dabbagh & Bannan-Ritland, 2005) to produce “design principles”.

Table 1.2: Summary of the research phases of Dabbagh & Bannan-Ritland (2005)

ILDF	Research questions	Objectives	Design	Method	Reasoning strategies
Phase 1 The exploration phase	1. What knowledge do students, lecturers and clinical facilitators have about mobile devices?	1. To explore the knowledge of students, lecturers and facilitators on the use of mobile devices.	Quantitative	Electronic survey	Deductive
The analysis of practical problems experienced by participants	2. What are the perceptions of students, lecturers and clinical facilitators on the affordances of m-learning with ITCP of the ENT health assessment?	2. To explore and describe the perceptions of students, lecturers and clinical facilitators on ITCP of the ENT health assessment in the PCCSM through m-learning in an	Qualitative	Focus groups; Individual interviews	Inductive

		undergraduate nursing programme at an HEI in the WCP.			
Phase 2: The enactment phase Iterative cycles of testing and refinement of solutions in practice	3. How can a plan be developed to integrate theory and clinical practice of the ENT health assessment in the PCCSM through m-learning?	3. To develop a plan for intervention for the integration of the theory and clinical practice of the ENT health assessment in the PCCSM through m-learning.	Qualitative	Conceptualisation of findings	Synthesis
	4. What is the plan developed (intervention) to integrate mobile technology in the theory and clinical practice of the ENT health assessment in the PCCSM through m-learning?	4. To implement the plan developed (intervention) to integrate theory and clinical practice of the ENT health assessment in the PCCSM through m-learning.		AT of Engeström (2008) as adapted	
Phase 3: Evaluation through reflection To produce "design principles" and enhance solution implementation	5. What are the reflections of the students, lecturers and clinical facilitators on the implementation of the plan developed for intervention to integrate theory and clinical practice of the ENT health assessment in the PCCSM through m-learning?	5. For students, lecturers and clinical facilitators to reflect on their experiences during the implementation of the plan developed for intervention to ITCP of the ENT health assessment in the PCCSM through m-learning.	Qualitative	Online reflections	Deductive
	6. How can lecturers be supported (recommendations) to integrate theory and clinical practice of the ENT health assessment in the PCCSM through m-learning?	6. To discuss recommendations for lecturers on how to integrate theory and clinical practice of the ENT health assessment in the PCCSM through m-learning.	Not applicable	Not applicable	Synthesis

1.12 ETHICAL CONSIDERATIONS

Ethical approval (12/10/16) for this study was obtained from the Senate Higher Degrees Committee of the Faculty of the Community Health and Sciences, and the Registrar and the Director of a school of nursing at the university where the study was conducted. After the purpose of the study and the expectations of the researcher had been explained (see Chapter 2), written informed consent was obtained from participants prior to their involvement in the research study, after the purpose of the study and the role of the researcher and team had been explained (See Chapter 2).

1.13 CONTRIBUTION OF THE STUDY

This was the first study of this nature that was conducted at a specific HEI in a nursing undergraduate programme in South Africa. Several studies, both globally and in South Africa, have described how the use of technology in health can be feasible and beneficial (Fairhurst & Sheik, 2008; Klasnja & Pratt, 2012; Leon, Schneider & Daviaud, 2012; Vivekanantham & Ravindran, 2014; Williams, Cassella & Maskell, 2017), however not in this field. This study was therefore designed to contribute to the effective use of mobile devices to enhance learning in health education in nursing science.

The researcher anticipated that the integration of mobile technology across the four-year levels in the undergraduate nursing programme would be an innovative way for students to be assisted in bridging the problem of linking theory with clinical practice, as they would have resource material on conditions or procedures available at any time or at any given place, both off-campus and in the clinical field (Cook, Pachler & Bradley, 2008; Bennett, Maton & Kervin, 2008; Liu *et al.*, 2003).

1.14 DESCRIPTION OF CHAPTERS

This thesis includes the following chapters:

Chapter 1: Introduction and background

Chapter 2: Research design and methodology

Exploration

Chapter 3: Literature review

Chapter 4: Quantitative exploration of Phase 1

Chapter 5: Qualitative exploration of Phase 1

Enactment and evaluation

Chapter 6: Developing the plan

Chapter 7: Implementation and evaluation of the plan developed for intervention (Iteration 1)

Chapter 8: Implementation and evaluation of the plan developed for intervention (Iteration 2 & 3)

Chapter 9: Conclusion, summary and recommendations

Chapter 1 provides the motivation and support for the implementation of the research study on the inclusion of mobile technology to enhance ITCP of the ENT health assessment in the PCCSM. The chapter outlines the following: an introduction (to give context to the study); background to the phenomena; relevance of the study; problem statement; purpose and objectives of the study; and research questions. This chapter concludes with an outline of the remainder of the thesis.

Chapter 2 introduces the methodology with reference to the ILDF of Dabbagh and Bannan-Ritland (2005) and gives the details of this design-based study. A description is included on the framework, as well as a rationale as to why this methodological framework was deemed most appropriate for the study.

Chapter 3 discusses relevant literature related to m-learning including a formal method of documentation of information on and insight into learning and the instructional design method, ILDF of Dabbagh and Ritland-Bannan (2005). The literature review provides a motivation for the need for the implementation of the research study and identifies the affordances of m-learning, to confirm the pedagogical underpinning to develop, plan and implement an intervention.

Chapter 4 provides a summary of the findings of the electronic survey that was implemented. The data on the knowledge of students, lecturers and clinical facilitators on the affordances of

mobile devices to ITCP of the ENT health assessment through m-learning is presented (Objective 1).

Chapter 5 narrates the qualitative exploration and perceptions of students, lecturers and clinical facilitators on topic (Objective 2). The findings are integrated with literature.

Chapter 6 describes the plan developed (Objective 3) to be implemented.

Chapter 7 describes the first of the three iterations of the intervention that was implemented (Objective 4). After the first iteration, participants reflected on their perceptions on the implementation of the plan by submitting an electronic response. Based on the findings and important issues that emerged from the reflections, the design was refined for the second iteration (Objective 5). Chapter 7 also collates the findings from the first iterations and discusses their significance, supported by literature to enhance or strengthen the findings. Chapter 8 continues with the second and third of the three iterations that contributed to the development of recommendations for lecturers and clinical facilitators on how to ITCP of the ENT health assessment (Objective 5).

Chapter 9 provides a conclusion of the research process and includes an overview of the study's contribution to the methodological framework, theory and practice of teaching and learning. The chapter furthermore includes a summary of the main findings of the study and discusses the objectives that have been achieved. The chapter also focuses on the recommendations for future research based on the results of the study and highlights the limitations of the study (Objective 6).

1.15 SUMMARY

This chapter presented the rationale and synopsis of the research study, which set out to explore the affordances of m-learning to enhance ITCP of the ENT health assessment in a primary care and clinical skills module in an undergraduate nursing programme at an HEI in the WCP.

An overview of the current mobile learning environment was addressed alongside the need for mobile learning initiatives in the current higher education scenario. The problem around the integration of theory and clinical practice specifically to a module in the undergraduate nursing programme, was outlined. This led to certain questions posed aligned to the ILDF of Dabbagh and Ritland-Bannan (2005) incorporating an intervention followed by a constructivist approach

(Vygotsky, 1978). The purpose of the study was thus strongly supported through the methodology implemented. The role of the researcher in the study is of paramount importance as part of the team in a design-based study (Shattuck & Anderson, 2013). The three phases are clearly outlined with quantitative and qualitative designs. An overview of the methodology was provided. Chapter 2 will describe it more in-depth.



2 CHAPTER: METHODOLOGY



“In much of society, research means to investigate something you do not know or understand.”

Neil Armstrong

2.1 INTRODUCTION

This chapter outlines the manner in which the research process was embarked upon and includes a description of the research design, the methods of data collection and the data analysis relevant to the proposed outcomes of the study (Creswell, 2014; Howell, 2013). The research design is an approach or strategy used to combine different components of the study in an articulated and logical way to ensure that the research problem is adequately addressed. The research design can furthermore be summarised as the blueprint for the collection, measurement and analysis of the data collected (Johnson, Christensen & Turner, 2014).

This study explored and described the affordances of mobile learning (m-learning) to inform the development of a plan to integrate the theory and clinical practice (ITCP) of the ENT health assessment in the primary care and clinical skills module (PCCSM) in an undergraduate nursing programme at an HEI in the WCP. The researcher set out to develop recommendations to guide lecturers in their integration of the theory and clinical practice of the ENT health assessment into the PCCSM through m-learning.

This chapter delineates the research design and the use of appropriate research methods addressing the purpose and objectives of the study (as set out in Chapter 1). The research design for this study is design-based research (DBR), which is a relatively new research approach compared to other research approaches in higher education (Anderson & Shattuck, 2012).

The chapter begins with a description of the research design and the components of the ILDF of Dabbagh and Bannan-Ritland (2005), used in this research study. The chapter describes the research design and methods, ethical research principles and practices, and trustworthiness of the

study. The researcher included both quantitative and qualitative research approaches to investigate the phenomena.

2.2 DESIGN

Design-based research (DBR) was chosen as being appropriate for bridging the gap between educational practice and theory, as it aims to both develop theories about domain-specific learning and creates spaces to support that learning (McKenney & Reeves, 2012; van den Akker, Gravemeijer, McKenney & Nieveen, 2006, in Bakker & Van Eerde, 2014). This DBR framework can be defined as a systematic, yet flexible, methodology aimed at improving educational practices through iterative analysis, design, development and implementation of an intervention (Wang & Hannafin, 2005). DBR is defined by Wang and Hannafin (2005:7) as:

... systematic but flexible methodology aimed to improve educational practices through iterative analysis, design, development, and implementation, based on collaboration among researchers and practitioners in real-world settings, and leading to contextually-sensitive design principles and theories.

This design is based on the collaboration between researchers and practitioners in real-world settings and it has the potential to develop contextually-sensitive design principles and theories (Wang & Hannafin, 2005). Collins (2010) supports a systematic methodology to conduct DBR, observing that when designing a learning environment, whether computer-based or not, there are a multitude of design decisions that must be made. Many of these design decisions are made unconsciously without any articulated view of the issues being addressed or the trade-offs involved. DBR is based on the premise that it would be better if these design decisions were consciously considered, rather than unconsciously made.

Barab and Squire (2004) contend that DBR moves beyond just observing, as it involves systematic engineering to improve and generate evidence-based results in learning in realistic contexts, such as clinical nursing practices.

A methodological design-based framework, the ILDF of Dabbagh and Bannan-Ritland (2005), was identified to transition this m-learning intervention beyond the isolated, individual efforts of investigating issues. By applying the ILDF to this research study, the researcher endeavoured to construct an articulated, methodical, yet dynamic, structure. Dabbagh and Bannan-Ritland

(2005) found that the traditional instructional design models were difficult to apply, due to a lack of flexible “interactiveness” and a lack of adaptability in the processes.

The premise of ILDF is that it affords a flexible process of online design and development with an emphasis on a constructivist social and cultural perspective of learning and design. Constructivist learning models provide the potential for the stimulation of meaningful learning through a systematic, iterative online design and development process (Dabbagh & Bannan-Ritland, 2005).

The purpose of the ILDF is to establish what the online learning developer knows and believes about teaching and learning, and how to transfer knowledge through using and maximising an online environment. The online learning space created could be used to design, develop or facilitate a course. The online learning developer may work within a team but will remain central in the design and development process. The developer therefore explores the perspectives and experiences related to the teaching and learning practice (Dabbagh & Bannan-Ritland, 2005).

The following six attributes of online learning design and development, identified by Dabbagh and Bannan-Ritland (2005) and beneficial to the creation of an online m-learning enactment, supported this study:

- 1 Telecommunications and technology enable the social processes of globalisation and learning.
- 2 Learning in a group with the lecturer (researcher) plays an important role in the attainment of sustained learning.
- 3 Online learning is not dependent on the physical presence of the learner or the educator.
- 4 Teaching and learning can take place at any time or place and can be synchronised through different modes of technology.
- 5 The m-learning platform creates access to various forms of interaction including learner with learner, learner with group, learner with content and learner with instructor (educator).
- 6 Teaching and learning can continue uninterrupted through the Internet and/or web-based technology.



The three phases of the ILDF employed to systematically develop online m-learning in a School of Nursing (SON) included the exploration, enactment and evaluation phases (Dabbagh & Bannan-Ritland, 2005). The ILDF provides systematic guidelines to the research process (Figure 2.1), which was used in this DBR study. The phases were linked to the objectives of this study.

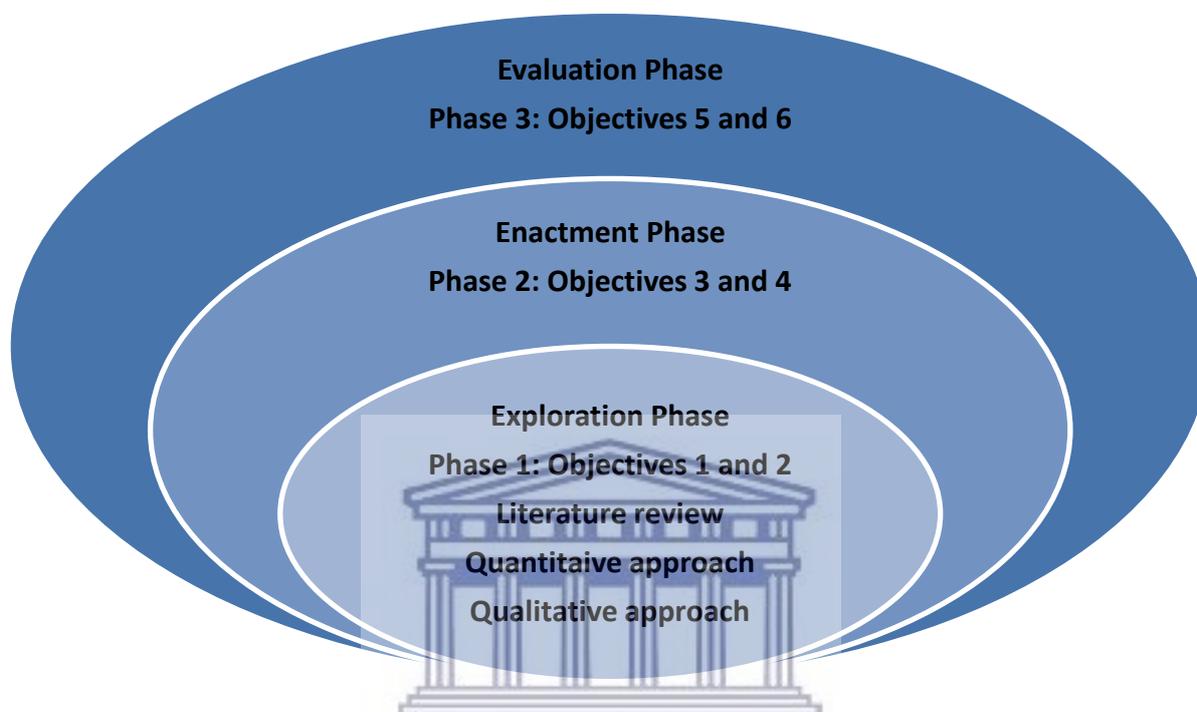


Figure 2.1: Methodological framework - ILDF

The researcher designed and systematically changed learning activities after each of the three iterations in the enactment phase that were implemented in anticipation of developing recommendations. The recommendations for lecturers and clinical facilitators are original and evidence-based, providing guidance on how to integrate the theory and clinical practice of the ENT health assessment through m-learning. Herrington, McKenney, Reeves and Oliver (2007) explain that DBR integrates solutions to practical problems identified in the learning environment. The design-based study was deemed appropriate to ensure that the purpose and objectives of the study were attained within the ILDF of Dabbagh and Bannan-Ritland (2005).

2.3 RESEARCH SETTING OF THE STUDY

The birth of the South African democracy in 1994, brought about transformation and restructuring, in higher education. The then Minister of Education, the late Minister Kader Asmal, announced in December 2002 that, from 2005, there would only be two institutions in

the WCP where undergraduate nursing students can enrol. The Cape Higher Education Consortium (CHEC) proposed the establishment of a common teaching platform for undergraduate nursing education in the WCP to meet the objectives of national and provincial government, making optimal use of the combined strengths of the three universities and a University of technology in the WCP. This proposal was accepted by Minister Kader Asmal, and the common teaching platform, a unique form of collaboration, was established in 2005 (Daniels, 2010). The study was conducted at one of these universities which accommodates the majority of the nursing students in the WCP.

An important goal of the National Plan for higher education (2001) was:

“to provide increased access to higher education to all irrespective of race, gender, age, creed, class or disability and to produce graduates with the skills and competencies necessary to meet the human resource needs of the country” (DoE, 2001).

The national policy initiatives did not only address the shortage of nurses, but also addressed the need to transform nursing education, practice and collaboration in South Africa (Daniels & Khanyile, 2013; Jooste & Jasper, 2012; Seekoe, 2014).



Figure 2.2: Examples of HEIs in the WCP

At a school of nursing at the university in the WCP where the study was conducted, student numbers were high (300) which necessitated effective teaching methods over the years. The adoption of the case-based education approach was used to effectively facilitate the large classes in the Bachelor of Nursing programme since 2005 (Daniels, Fakude, Linda & Modeste, 2015).

The school of nursing is located in a faculty of Community and Health Sciences. The school of nursing offering the undergraduate programme is recognised by the SANC as a body which upholds high standards of nursing education and practice within the Republic of South Africa.

The Bachelor of Nursing is a four-year, comprehensive undergraduate programme. In the Bachelor of Nursing, students are required by the SANC to complete a total of 4000 clinical hours over the four-year period. The SANC's notification of completion of training (Annexure 25) in the education and training of a nurse (general, psychiatric and community) and midwife (R425, 1985, as amended) guides a school of nursing at the university on how the 4000 clinical hours have to be allocated and completed.

The Nursing Act, 2005 (Act No. 33 of 2005) states that a clinical placement facility is a:

continuum of services to promote health and provide care to individuals and groups, used to teach learners (students).

Clinical placements of undergraduate nursing students at a primary level of care are provided by the Department of Health and the City of Cape Town in the WCP, through a memorandum of agreement updated yearly.

Examples of the SANC accredited clinical placement facilities for clinical training of Government Notice No. R.425, 1985, as amended, are set out in Table 2.1.

Table 2.1: Examples of accredited clinical facilities in the WCP

Department of Health	City of Cape Town
Bellville Community Health Centre	Adriaanse Clinic
Durbanville Community Health Centre	Bishop Lavis Clinic
Dirkie Uys Community Health Centre	Dirkie Uys Clinic
Elsiesriver Community Health Centre	Guguletu Clinic
Guguletu Community Health Centre	Hanover Park Clinic
Hanover Park Community Health Centre	Ikwezi Clinic
Kasselsvlei Community Health Centre	Kraaifontein Clinic
Nolungile Community Health Centre	Khayelitsha Site B Clinic

Examples of locations of community health facilities in the WCP are seen in Figures 2.3 and 2.4.

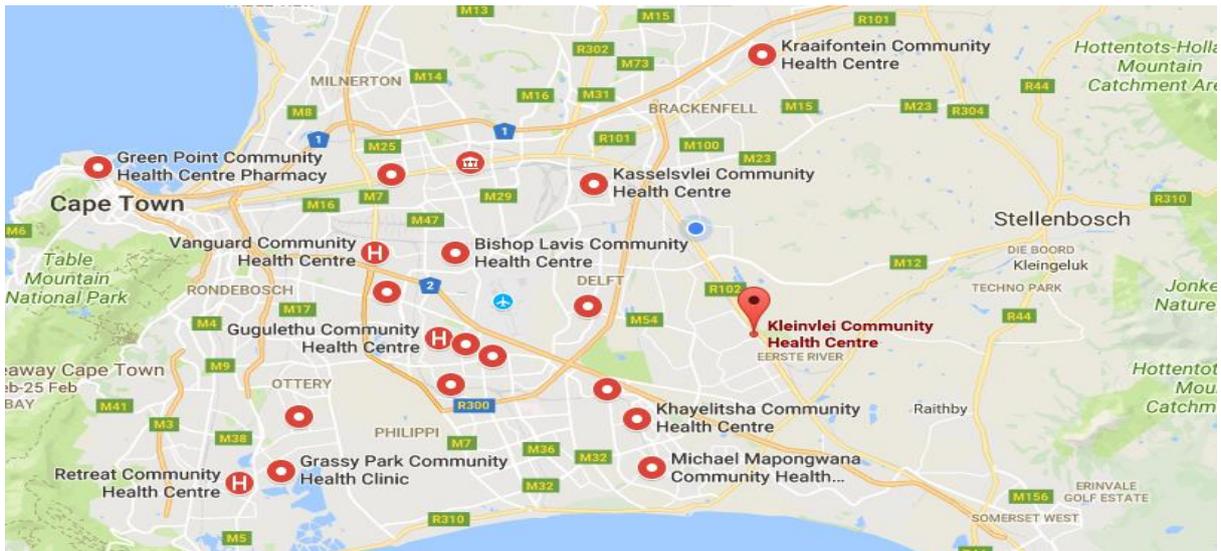


Figure 2.3: Examples of locations of a DOH CHC

(Source: www.google.co.za/maps/search/community+health+centres+in+the+cape+metropole/)

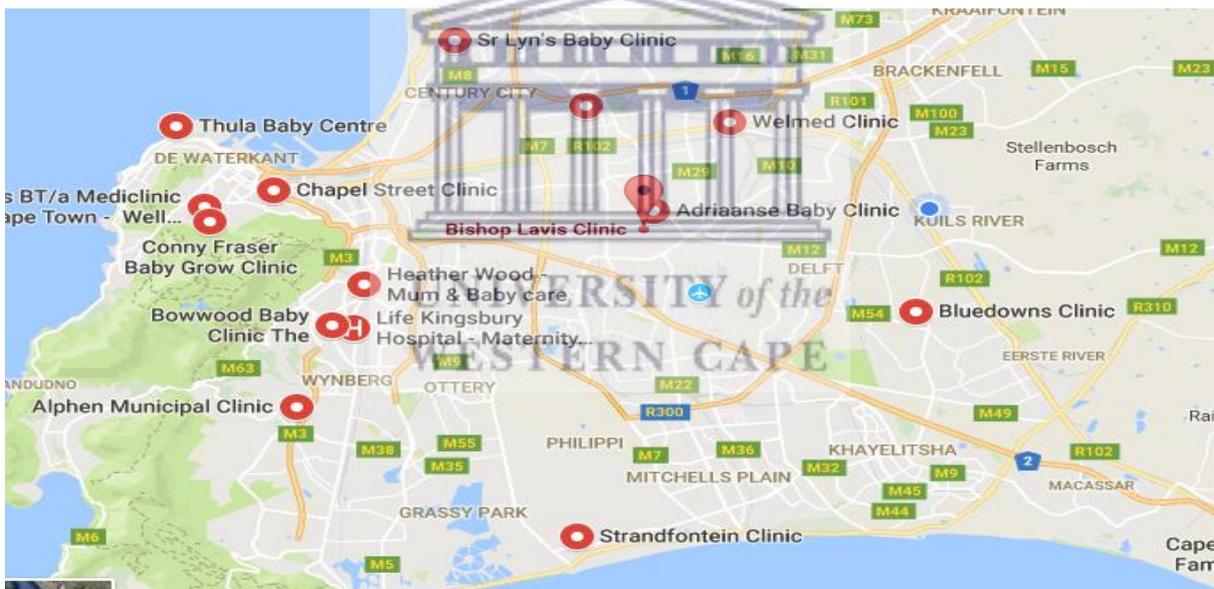


Figure 2.4: Examples of locations of a City of Cape Town Clinic

(Source: www.google.co.za/maps/search/city+of+cape+town+clinics/)

In these health facilities authentic, flexible, blended and case-based online m-learning intervention using WhatsApp Messenger, could be enhanced by the availability of free Internet access at health facilities. Examples of these health facilities are illustrated in Table 2.2.

Table 2.2: Examples of health facilities with free Internet access


The screenshot shows the Western Cape Government website. The header includes the Western Cape Government logo and the slogan "BETTER TOGETHER." A search bar is located in the top right corner. The main navigation menu includes: Home, Your Life, Topics, Documents, Directories, Your Government, Tenders, Jobs, About Us, and Contact Us. The breadcrumb trail reads: Home > Your Government > City of Cape Town > Facilities > Health > Clinics. The page title is "City of Cape Town - Facilities: Clinics". On the left, there is a sidebar menu with options: Overview, Services, Projects, News, Speeches, Documents, Public Entities, Facilities (highlighted), and Contact Us. The main content area contains a table with two columns: Facility and Location. The table lists ten clinics and their respective locations.

Facility	Location
Adriaanse Street Clinic	Clarke Estate
Albow Gardens Clinic	Milnerton
Alphen Clinic	Constantia
Bishop Lavis Clinic	Bishop Lavis
Bloekombos Clinic	Kraaifontein
Blue Downs Clinic	Blue Downs
Bothasig Clinic	Bothasig
Brackenfell Clinic	Brackenfell
Brighton Clinic	Kraaifontein
Camelot and Silversands Satellite Clinic	Malibu Village

(Source: www.westerncape.gov.za/your_gov/33/facilities/944)

2.4 QUANTITATIVE AND QUALITATIVE PHASES (OBJECTIVES 1 AND 2)

The researcher purposefully combined: (i) the statistical strengths of a quantitative research phase – to explore the knowledge of students and lecturers and clinical facilitators about mobile devices – with, (ii) a qualitative exploration and description of the perceptions of students, lecturers and clinical facilitators on ITCP of the ENT health assessment through m-learning, to afford an enriched understanding of the research problem (Creswell, 2015).

Although quantitative and qualitative research methodologies differ, they can be complementary (Firestone, 1987). The emphasis of this research study was to gain evidence-based data regarding the use of mobile technology in undergraduate nursing to enhance ITCP of the ENT health assessment. The purpose was to provide recommendations for lecturers to guide “*effective and efficient*” future use of mobile technology in nursing education, as demonstrated in Figure 2.5.

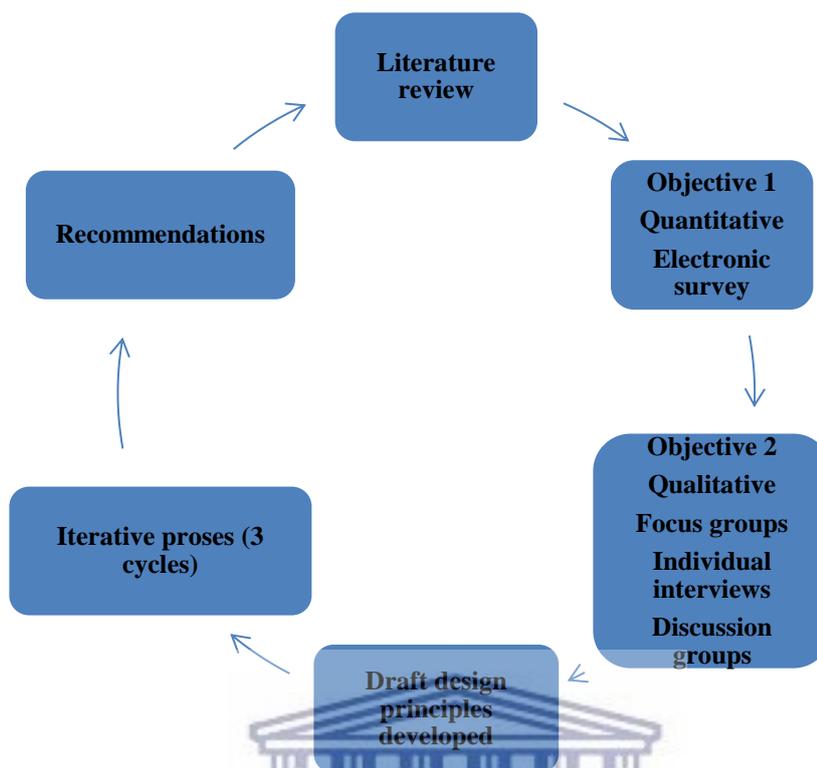


Figure 2.5: Research process

The research study was conducted with undergraduate third-year nursing students registered for the primary care and clinical skills semester module, with the purpose of developing recommendations for lecturers on how to introduce m-learning interventions in nursing education.

2.5 PHASE 1: THE EXPLORATION PHASE

The exploration phase addressed Objectives 1 and 2 (see Section 1.7).

The exploration phase, as mentioned by Dabbagh and Bannan-Ritland (2005), commenced with a literature review (Chapter 3) to develop an “*explicit document of insights and findings from the gathered information*” (Table 3.6).

The literature review addressed the learning theories appropriate for online instruction; m-learning and constructivism; m-learning in relation to nursing education; social media in m-learning; and the affordances of social media applications. From the literature, certain

conclusions were drawn, with reference to the theoretical framework (Chapter 1) on authentic, flexible and blended learning.

During the exploration phase data was collected about individual and collective perceptions on learning, as well as information from significant persons within the training programme (Dabbagh & Bannan-Ritland, 2005). The theoretical framework of social constructivism (Vygotsky, 1978) enhances learning through the creation of socially interactive, authentic, flexible and blended learning activities. These activities could allow the creation, innovation and communication of the ENT health assessment in the PCCSM.

2.5.1 General principles and practices of Dabbagh and Bannan-Ritland (2005) followed in the exploratory phase

Pedagogical models are cognitive models or theoretical concepts resulting from learning theory that could guide the implementation of an instructional or online learning strategy and link theory to practice. How people learn, how knowledge is constructed, how knowledge is stored and retrieved when needed are guided by knowledge acquisition and representation models (Illeris, 2007).

Pedagogical models applied in this study included situated, authentic, flexible, blended and case-based learning within a constructivist learning approach. These models afforded the infrastructure for the online m-learning intervention using WhatsApp Messenger.

A discussion of the different principles and practices used in the exploratory phase follows (objectives 1 and 2):

2.5.1.1 Document findings

This section of the exploration phase includes documenting personal understandings, beliefs and insights into student and curricular content and analyses of different approaches to online teaching and learning. This allows for a transformational process, converting the instructor's existing knowledge of teaching and learning practices into insight on an online delivery, a process Collins (1997) calls "pedagogical reengineering" (Dabbagh & Bannan-Ritland, 2005). The first step (objective 1) of the exploration phase in this study included a literature review (Chapter 3) that allowed for a formal method of documenting the information on and insight into learning and its instructional design method (Dabbagh & Bannan-Ritland, 2005).

2.5.1.2 Gather information about the instructional or training context

The design of a new online teaching and learning intervention was informed by both quantitative and qualitative approaches, in order to obtain information those involved to ensure their acceptance of the project and support (Dabbagh & Bannan-Ritland, 2005). Information was gathered through an electronic survey (Chapter 4), completed by students (Annexure 14), lecturers and clinical facilitators (Annexure 16). This survey for the specific context was based on the literature review (Chapter 3). This was followed by focus groups and individual interviews (Chapter 5).

2.5.1.3 Examine individual perspectives on the learning process

All data (Phase 1) collected was systematically analysed to inform the enactment phase (Phase 2) (Dabbagh & Bannan-Ritland, 2005).

2.5.2 Incorporate published perspectives on the learning process according to Dabbagh and Bannan-Ritland (2005)

The literature review (Chapter 3) investigated appropriate teaching and learning practices in mobile technology from primary and secondary sources. Various search engines (including EbscoHost Web, Computer Index to Nursing and Allied Health Literature (CINAHL), Sage Journals Online, PubMed, Science Direct, Google and Google Scholar) were consulted to access the most suitable articles and textbooks and guided this research process. The literature review allowed an assessment of perspectives on learning in traditional and online learning contexts and the most beneficial strategies were incorporated into this study (Dabbagh & Bannan-Ritland, 2005).

2.5.2.1 Solicit perspectives and existing information on the learning process, content and online delivery method

At this step of the exploration phase, data for developing the intervention (supported by literature on the perspectives of learning) was gathered and documented. To create an authentic intervention in the enactment phase, the most important elements regarding the learning process and the method of mobile delivery were identified. This process involved all the major role-players, including the students and lecturers and clinical facilitators and specialists or experts in

the field of emerging technology and primary care and clinical skills (Dabbagh & Bannan-Ritland, 2005).

On completion of the literature review, the first step of the exploration phase of the ILDF of Dabbagh and Bannan-Ritland (2005), both the quantitative and qualitative methods were used to understand the identified research problem (Creswell, 2015).

The focus of the exploratory research was to explore the full extent of the phenomenon (Polit & Beck, 2018). The quantitative phase provided a general overview of the extent of the knowledge of the participants regarding the use of mobile devices, while this information was refined during the qualitative phase (Creswell & Plano Clark, 2010). The research approaches were carefully selected to ensure that the purpose and objectives of this research study were attained.

2.5.3 Quantitative phase: Objective 1

A literature review (Chapter 3) informed the questions of the research instrument, in which the aim was to explore the knowledge of students and lecturers and clinical facilitators on the affordances of mobile devices for teaching and learning (Chapter 4).

2.5.3.1 Study population

A study population can be described as every potential individual who has the specific characteristics needed to assist the researcher to answer the research problem identified (Delport & Fouche, 2011). The population of this study included an “accessible” population, as the researcher had reasonable access to the selected study population (Burns & Grove, 2017; Teddlie & Tashakkori, 2009).

The student target population (N=114) were in their third-year of study as part of a four-year Bachelor’s degree in nursing at a school of nursing at an HEI in the WCP. The students were all engaged in the ENT health assessment as part of the outcomes of their PCCSM (Annexure 23). The module was offered in both semesters in a year with two different classes, thus four classes in total. The study population of Objectives 1 and 2 was students undertaking the course in the first semester (N=114).

Students were placed at SANC accredited clinical facilities two days per week (16 hours per week), where they were engaged in clinical activities to attain competence in conducting a health

assessment, a component of their PCCSM. This meant that students were exposed to patients presenting with health challenges and that they had to follow guidelines to examine, diagnose and manage a patient under direct supervision of a clinical nurse practitioner. The study focused on health challenges related to the ENT and it was ensured that all students were exposed to patients presenting with conditions of the ENT while within their clinical placement for this module.

The target population included the lecturers and clinical facilitators (N=6) who were involved in the facilitation of the PCCSM. The lecturers and clinical facilitators each had at least five years' experience in either the theoretical or clinical facilitation of this module.

2.5.3.2 Sampling technique and sample

Convenience sampling was used that is a type of non-probability or non-random sampling method in which the target population meeting the inclusion criteria for the study provides easy access to participants who are in geographical proximity and are available at a given time (Dornyei, 2007). To be included in the study, the students and lecturers and clinical facilitators had to display specific characteristics (Burns & Grove, 2017) to ensure that no participant comes into the study with an added advantage. To be included in the study, students, lecturers and clinical facilitators had to:

- be in possession of a personal mobile device;
- be prepared to use their personal mobile device as a tool in the study;
- have personal data bundles available to participate in the study; and
- be registered for the PCCSM (if they were students).

Fieldworkers approached the students, lecturers and clinical facilitators to explain the study and request participation in an electronic survey during a large class session. Written consent was provided followed by the electronic surveys. All participants who met the inclusion criteria and volunteered to partake in the study were included in the sample. The majority of 84 from the 114 students volunteered to take part in the survey. All lecturers and clinical facilitators (n=6) volunteered to participate in the study. The PCCSM is a semester module at an HEI and the six lecturers and clinical facilitators are involved in facilitating this module.

2.5.3.3 Research design

The non-experimental exploratory and descriptive quantitative research approach (for Phase 1, Objective 1), using an electronic survey, aimed at exploring the knowledge of students and lecturers and clinical facilitators about m-learning (Brink, van der Walt & van Rensburg, 2017).

2.5.4 Exploratory research design

An exploratory research design endeavours to prepare a foundation for this research study as it provides an understanding of the research problem identified. The main purpose of exploratory research is to explore new knowledge (Polit & Beck, 2018).

2.5.4.1 Descriptive research design

Descriptive research methods follow an exploratory research approach and use consistent statistical tools to describe, for example, averages, medians and frequencies. The inferential data analysis was used to draw conclusions about the data collected and the research population (Terre Blanche, Durrheim & Painter, 2014).

2.5.4.2 Method

A step in this design-based research was departing with a survey. A survey is a quantitative research strategy through which data collected can be analysed by applying descriptive and inferential statistics (Saunders, Lewis & Thornhill, 2009). Groves, Fowler, Couper, Lepkowski, Singer and Tourangeau (2009) describe a survey as a “systematic method for gathering information from (a sample of) entities for the purpose of constructing quantitative descriptors of the attributes of the large population of which the entities are members”. Stoop and Harrison (2012) classify surveys based on the interrogatives such as *who, what, by whom, how, when, where* and *why*.

The increased use of the Internet and computer-mediated communication motivated the choice of an online survey using Google Drive as a quantitative data collection method (Fox, Rainie, Larsen, Horrigan, Lenhart, Spooner & Carter, 2001; Horrigan, 2001; Nie & Erbring, 2000; Nie, Hillygus & Erbring, 2002; Wright, 2006). The increasing use of online surveys presents research scholars with new opportunities for changing traditional survey research methods through the use of the Internet (Andrews, Nonnecke & Preece, 2003; Wright, 2006; Yun &

Trumbo, 2000). The advantages of an online survey using Google Drive were identified by Wright (2006) as follows:

- It allows the researcher access to participants who share specific interests, attitudes, beliefs and values regarding an issue, problem or activity.
- It saves the researcher time as it allows simultaneous access to many people with common characteristics, irrespective of their geographical differences and distances.
- It is cost-effective as no paper or printing is involved; thus, it is a convenient manner of data collection.

Sincero (2012) identified the following advantages of online surveys:

- They increase accuracy of data collected.
- They provide all participants with a standardised stimulus, ensuring reliability as the researcher's own biases are eliminated.

Based on a literature review, a similar data collection tool for students and lecturers and clinical facilitators respectively was designed in the form of an electronic survey (developed in Google Forms, an application in a suite of applications in Google Drive) (Annexure 14 & Annexure 16). The reason for developing a new instrument was the scope of the questions, not found in another instrument. Developing the survey in Google Drive was preferential, since it is a free and flexible service from Google that includes word processing and presentation components. It furthermore had the function of enabling multiple authors to work collaboratively on the same document in real-time (Rowe, Frantz & Bozalek, 2013).

The electronic instruments (Table 2.3) for students (Annexure 14), lecturers and clinical facilitators (Annexure 16) were self-administered and explored the knowledge, involvement and enthusiasm of participants regarding the use of mobile technology to enhance teaching and learning.

Table 2.3: Main structure of the electronic instruments

INSTRUMENTS			
SECTION	HEADING	STUDENTS	LECTURERS AND CLINICAL FACILITATORS
Section A	Biographical information	2	2
Section B	Being mobile (“Mobileness”)	5	5
Section C	Internet connectivity	6	7
Section D	Communication	11	14
TOTAL QUESTIONS ASKED		24	28

The student survey had 24 questions, while the survey for lecturers and clinical facilitators consisted out of 28 questions.

A brief outline of the different sections of the electronic survey (Table 2.3) includes the following:

Section A: Biographical information

Two questions (relating to biographical data) were in both the questionnaires of the students and lecturers and clinical facilitators on their sex and age.

Section B: Being mobile (“Mobileness”)

In this section, the student survey had five questions while the survey of lecturers and clinical facilitators had seven. The survey focused on determining: (i) when participants first started using a mobile device; (ii) how they learned to use the applications or functionalities available on their mobile device; and (iii) how comfortable they were with using their mobile devices.

Section C: Internet connectivity

In this section, the student survey comprised six questions while the survey of lecturers and clinical facilitators had nine questions. This section aimed to determine the ability of participants to access the Internet and which type of Internet connection they mostly used. There were also questions to determine the preparedness of participants to use their mobile devices for a m-learning project and to identify the mobile applications of choice on their mobile devices for such an intervention.

Section D: Communication

In this section, the student survey comprised 11 questions, while the survey of lecturers and clinical facilitators comprised 14 questions. The questions determined the degree of preference for each method of communication for a m-learning intervention. Some of the questions required a simple “Yes/No” response, while others were structured questions using a 5-point Likert scale (Table 2.4) where participants were asked to indicate their response to a given statement (1=never – 5=always).

Table 2.4: Five-point Likert scale

NEVER	HARDLY EVER	SOMETIMES DO	FREQUENTLY	ALWAYS
1	2	3	4	5

Likert or summated rating scales are used in a self-reported data collection instrument where participants respond numerically to the question posed based on their perceptions (Delpont & Fouché, 2011). The Likert scale was used to allow participants in the study to respond to the questions, capturing the strength of their views and knowledge regarding the use of mobile devices for a m-learning initiative. The Likert scale rating allows an indication of the extent to which the participant agrees with the statement made.

Each participant needed approximately 30 minutes to complete the electronic survey at a time and place agreed upon. A collective session was arranged in a private room at the HEI where all the participants were able to complete the questionnaire while the researcher was able to clarify and guide as needed. Some open-ended questions were included in the instrument. It was important to establish the extent of their knowledge about the use of mobile devices and how it could be used to enhance the integration of the theory and clinical practice of the ENT health assessment.

2.5.4.3 Pre-testing of the instrument

The pre-testing of the instrument was conducted in March 2013 on ten third-year undergraduate nursing students who already completed their third year of study and one lecturer and one clinical facilitator. Minor issues were identified by students while completing the pre-testing of the instrument. The students used their Gmail accounts to complete the pre-testing of the instrument. Certain challenges were experienced by the lecturers and clinical facilitators. The

instrument was sent to the formal HEI email accounts of two lecturers and clinical facilitators. It was found that, upon completion and submission, a duplication of the survey appeared. The survey subsequently had to be redone as all the previous responses were missing. One of the lecturers and clinical facilitators who had a Gmail account experienced that the survey only had to be completed once by “clicking” on the link received.

The pre-testing of the instruments also served to identify whether the respondents had any difficulty answering the questions (Saunders, Lewis & Thornhill, 2012). The identified corrections (mostly editing) were made before the distribution and implementation of the main survey using the Google Gmail addresses of all participants. In medical education research an evidence-based approach to questionnaire design, e.g. using Google Forms, has the potential to positively impact the overall quality of the research conducted (Artino, La Rochelle, Dezee & Gehlbach, 2014).

2.5.4.4 Preparation of the field

In preparation of the implementation of the main research survey created in Google Drive, the researcher arranged for a training session on Google Drive for the participating two lecturers and four clinical facilitators and then the students. The training was done by two facilitators from the e-teaching platform in the post graduate laboratory at a school of nursing at the HEI.

Reflective diary of the researcher

First training session in Google Applications

17 May 2013

We covered working in Google Drive and there was a lot of excitement during the training. There was just one of the lecturers that did not really participate in the training and told me that I will have to facilitate the process with both students' groups. This is completely acceptable as with any research it cannot be expected that all colleagues will be comfortable with a "new" way of facilitation being introduced to enhance the teaching and learning process of the students. I think with time and when witnessing the impact of the research, acceptance, comfort and ability to facilitate teaching and learning using mobile devices will follow.

All colleagues worked on either laptops or notebooks during the session. I could not use my iPad during the session, but that was due to challenges with Internet connectivity in the venue.

Our next training sessions are as follows:

Google Blogger (course and individual) and newsgroup (31st May from 09:00 – 11:00)

Facebook Group and Sakai introduction (07 June from 09:00 – 11:00)

We have decided that a computer laboratory at the university may be a better option to assure that all are connected no matter which device they will be using. The training received today was very new to some of the participants.

It was important to reflect that in a research study you cannot expect or assume that all colleagues will be comfortable to participate, especially with a "new" way of facilitation being introduced to enhance the teaching and learning process of the students. My view was that with time and seeing the impact that the research has on student success, they will accept it, and be more comfortable and able to facilitate teaching and learning using mobile devices.

The training session with the attending participants was positively received.

2.5.4.5 Implementing the electronic survey

After the information session all participants were given the option to complete the main survey either on the same day in the computer laboratory or off-campus. An informational leaflet (Annexure 7) and a written consent form were handed out at the venue where all participants were present. An explanation was given to clarify the research topic and to explain the purpose of this research study before participants were allowed to open and complete the online electronic survey. The participants who took part in the pre-testing of the instrument were not included in the main study.

The survey was available electronically to all participants (students (n=84) and lecturers and clinical facilitators (n=6) on who volunteered to be included in the study. The survey, created in Google Drive, was distributed using the Google Gmail (Figure 2.6) addresses to both participatory groups (students; lecturers & clinical facilitators).

From: willemsejj@gmail.com
 Date: Fri, 12 Apr 2013 08:55:35 +0000
 To: <[REDACTED]@gmail.com>
 Subject: Lecturers & Clinical Facilitator Survey_12 April 2013

If you have trouble viewing or submitting this form, you can fill it out online:

https://docs.google.com/forms/d/1M_dJpA9gxq4HORovVQajyYchzrR2vIvxi1_A8Z6yf8l/viewform?sid=57404e131545bf24&token=3bl2_T0BAAA.RinUJtvx8m0G1z5glyYZSg.6iQ6Scw16EdAyF8cFh_9DA

Lecturers & Clinical Facilitator Survey_12 April 2013

Submit

Never submit passwords through Google Forms.

Powered by  Drive

This content is neither created nor endorsed by Google.
[Report Abuse](#) - [Terms of Service](#) - [Additional Terms](#)

Figure 2.6: Example of the Google form created in Google Drive

The electronic survey (Annexure 16) was completed by lecturers and clinical facilitators on 12 April 2013. Written consent was obtained from the lecturers and clinical facilitators by two fieldworkers before they completed the electronic survey.

Students completed the electronic survey (Annexure 14) on or off-campus and a venue were also booked on-campus for students who preferred to complete the survey on-campus. A participant information sheet (Annexure 7) was handed out to each student who attended the research information session. They were informed about the inclusion criteria to participate in the study. Written consent was obtained from 84 students and they completed the electronic survey on 10 May 2013 (Annexure 15).

The link to the electronic survey (Figure 2.7) was emailed to all participants and both groups completed it in less than 30 minutes. The results from the quantitative data analysis are presented in Chapter 4.

If you have trouble viewing or submitting this form, you can fill it out online:
https://docs.google.com/forms/d/1M_dJpA9gxq4HORovVQajyYchzrR2vIvxi1_A8Z6yf8l/viewform?sid=57404e131545bf24&token=3bl2_T0BAAA.RinUJtvx8m0G1z5glyYZSg.6iQ6Scw16EdAyF8cFh_9D

A

Figure 2.7: Illustration of the electronic survey link

2.5.4.6 Quantitative data analysis

The data was statistically analysed by an independent HEI statistician. The IBM Statistical Package for the Social Sciences (SPSS), Version 22 was used to conduct the descriptive data analysis. Data (frequencies, mean values, and standard deviations) are presented in statistical charts and tables, since this allows analysed data to be presented in a manner that is easy to understand (Watson, McKenna, Cowman & Keady, 2008).

2.5.4.7 Validity and reliability

Heale and Twycross (2015) explain that rigour in quantitative research is achieved through the measurement of the validity and reliability of the study. Validity is defined as the extent to which a concept is accurately measured, while reliability guides in the extent to which the research instrument was consistent and would yield the same results if used in the same context on repeated occasions. There are three major types of validity, namely content validity, construct validity and criterion validity (Heale & Twycross, 2015). Face validity was used where participants that met the inclusion criteria were asked if what the instrument measured was clear and if they understood the questions. Content validity was ensured by including important conclusions drawn from the literature review in the research instrument that accurately measured all aspects of the phenomenon (Heale & Twycross, 2015).

The instrument was based on a literature review, and to ensure its content validity, five experts in the field of emerging technologies pre-tested it. These experts were able to provide guidance on 26 March 2013 on certain questions that had to be included in the survey with the purpose of receiving the expected outcome as illustrated in Table 2.5. The instrument was pretested for face and content validity.

Table 2.5: Extract from the review of an expert in emerging technology

Response from an expert in emerging technologies
I completed the form, just so you could have some test data.
You could consider editing the information sheet at the beginning. Not sure if the university address needs to be there.
Section B, question 3: Is it necessary to include the "I don't know" question?

Section B, question 4: How are the first and fifth options different?

Section B, question 5: You might want to include an option for “Searched online”

Question 6 is confusing. You include some brand names, some device names but you’re not consistent. For example, a Galaxy tablet is made by Samsung, which you have as a separate item. What is the difference between a 3G phone / smartphone and an iPhone?

Why do you have Acer and HP laptops (a notebook is the same as a laptop), but no other brands? Why not include Lenovo, Dell, etc.?

Question 8 and 9 seem like they won’t help much. Maybe you could include an option for participants to expand on their answers?

Question 11: For most people, broadband and wireless will be the same thing. Whether you’re connected to the router with a cable or wirelessly, it’s still broadband.

Question 16 is confusing. I answered “Yes” because I want to help students. Why else would anyone answer “Yes”?

Question 17: Blogger is only one type of blogging service. I blog, but I use WordPress, which means I can’t answer that question.

Same with Question 18: This one includes Gmail though. What if I use Hotmail?

Rather change that to include “Email”.

Question 21: I’m not sure if blogging is an online discussion?

Question 25: Not sure of the value of this question.

So what if someone answers “Yes” or “No”? You might want them to further explain why they answered “Yes” or “No”.

Question 30: What if I’m someone whose students don’t use video? I won’t be able to answer this question.

You have an “Untitled” section at the end that should be removed.

The reliability of the instrument was enhanced by ensuring that the questions were relevant to the participants in the study. Coefficient alpha is an index of internal consistency, estimating the extent to which the different items of an instrument are reliably measuring the critical attribute (Polit & Beck, 2018). Cronbach’s alpha coefficient of reliability, an alpha of 0.7, is normally considered to indicate the reliability of a data set (De Vos *et al.*, 2011).

The Cronbach's alpha coefficient of reliability of the students' survey (Table 2.6) was 0.589, which is lower as the norm of an alpha of 0.7, which is considered to indicate the reliability of a data set (De Vos *et al.*, 2011).

Table 2.6: Student surveys Cronbach's alpha coefficient of reliability

Reliability statistics	
Cronbach's alpha coefficient	Number of items
0.573	21

The assumption of the low reliability of a data set could be due to the different answering formats of items and the multi-dimensional scale used in the instrument of the survey.

The Cronbach's alpha coefficient of reliability of the lecturers and clinical facilitators (0.871) (Table 2.7) was higher than the norm of 0.7, which is considered to indicate reliability of the instrument (De Vos *et al.*, 2011).

Table 2.7: Lecturers and clinical facilitators' survey's Cronbach's alpha coefficient of reliability

Reliability statistics	
Cronbach's alpha coefficient	Number of items
0.871	14

The increased value of the Cronbach alpha score of 0.871 makes this a reliable instrument for the construct for analysis purposes. Objective 1 in the exploratory phase thus provided a general overview of the extent of the knowledge of the research participants, students and lecturers and clinical facilitators regarding the use of mobile devices. The findings informed the qualitative phase of the ILDF of Dabbagh and Bannan-Ritland (2005).

2.5.5 Qualitative phase: Objective 2

This exploratory, descriptive and contextual qualitative phase enabled data collection concerning the phenomena, environment, interactions, meaning and everyday life (Rubin & Babbie, 2011). Data gathering focused on an exploration and description of the perceptions of students and lecturers and clinical facilitators on ITCP of the ENT health assessment in the PCCSM through m-learning.

Students and lecturers and clinical facilitators therefore participated in and contributed towards the design and development of a plan on how to integrate the theory and clinical practice of the

health assessment in the PCCSM through the affordances of m-learning in the undergraduate programme at the HEI, even though they were not specialists in instructional design (Dabbagh & Bannan-Ritland, 2005).

2.5.5.1 Exploratory research design

An exploratory research design is aimed at the exploration of a phenomena of interest, such as a mobile learning enactment to enable the integration of theory and clinical practice. Exploratory research investigates the complete nature of the phenomenon, the manner in which it is manifested and the related underlying factors (Polit & Beck, 2018).

2.5.5.2 Descriptive research design

Descriptive research design methods provide an accurate and complete description of the phenomena under investigation and provide deeper meaning into the phenomena (Rubin & Babbie, 2005; De Vos *et al.*, 2011).

2.5.5.3 Contextual research design

Contextualisation is of the utmost importance to understand the reality of the research participants and does not merely focus on the physical environment but it produces an environment to collect data from participants in a structured manner regarding the phenomenon under investigation (Polit & Beck, 2018).

2.5.5.4 Study population

The accessible population were the same participants as in Objective 1. The accessible population thus constituted a total of 114 students registered for the primary care and clinical skills semester module in 2013 at a school of nursing at the HEI where the study was conducted, and two lecturers and four clinical facilitators (n=6) who facilitated the PCCSM.

2.5.5.5 Sampling technique and sample

Purposive or selective sampling was used in the qualitative phase. Sampling involved the selection from an accessible population, the purpose of which was to generate an understanding of the perceptions of students and lecturers and clinical facilitators about the use of mobile devices in an undergraduate nursing programme. Patton (2015) defines purposeful sampling as

the selection of individuals who have the necessary information needed for the purpose of the inquiry.

A total of eight students and three lecturers and clinical facilitators participated in the individual semi-structured interviews, as illustrated in Table 2.8.

Table 2.8: Qualitative phase: study participants

Participant category	Total number of participants	
	Number of focus groups	Number of individual semi-structured interviews
Students	Four focus groups Six participants per group	8
Lecturers and clinical facilitators	One focus group Five participants (2 lecturers & 3 clinical facilitators)	3 (1 lecturer & 2 clinical facilitators)

2.5.5.6 Data saturation

After conducting four focus groups and eight individual interviews with students and three individual interviews with lecturers and clinical facilitators, no new or relevant data emerged, and it was evident that saturation had been reached. No new or relevant data could be added to the themes or sub-themes or its properties were well established and confirmed (Bryman, 2016).

2.5.5.7 Method

Qualitative data was collected through focus groups and individual interviews with students, lecturers and clinical facilitators who voluntarily participated in the study. All qualitative data was collected in English as this was the language of instruction at the HEI where the study was conducted.

The interview sessions were arranged by two fieldworkers for a time that was convenient for the participants and the researcher. Adequate time (one hour per interview) was allowed for each session, to ensure that all sessions were completed within the time frame set out by the researcher and to prevent a delay in the completion of the study (Plano Clark & Creswell, 2010).

The following research question was posed to initiate the discussion in every focus group held with the student groups and with the group made up of lecturers and clinical facilitators: “*What is the integration of the theory and clinical practice in the teaching and learning of the ENT health assessment for you?*” Participants were encouraged to share their perceptions on the affordances of m-learning for the integration of the theory and clinical practice of the ENT health assessment to further extend the quantitative findings.

2.5.5.8 Focus groups

Focus groups were facilitated with four groups and there were six participants per group from the third-year level. Initially, six focus groups sessions were planned and scheduled (three focus groups from each of the two classes registered (classes duplicated) for the PCCSM in an undergraduate nursing programme, however after four focus groups, two groups from each class, data saturation was obtained.

A focus group interview can be summarised as individuals’ discussion of a specific topic in a conducive environment. These individuals usually share similar backgrounds and interests (Schurink, Schurink & Poggenpoel, 2011). It is important that the researcher clarifies the aims of the focus group with participants prior to the session.

Focus groups usually have a maximum number of ten participants (minimum of six), which affords everyone in the group an opportunity to participate. The size of the group depends on how much time is needed for the discussion, and to ensure that every member in the group is awarded an opportunity to respond (De Vos *et al.*, 2011). Focus groups were planned with groups of six to ten participants, depending on the sizes of the student groups, and lecturers and clinical facilitators group.

One focus group was held with five lecturers and clinical facilitators. The focus group and conceptualisation group session facilitated with the lecturers and clinical facilitators were conducted in the boardroom of a school of nursing at the HEI. One focus group and one conceptualisation discussion group session were held with lecturers and clinical facilitators. Focus groups were arranged for a time that was convenient for both the participants and the researcher. Adequate time was allowed for each session to ensure that all sessions were completed within the time frame set out by the researcher and to prevent a delay in the

completion of the study (Plano Clark & Creswell, 2010). The length of the focus group sessions varied between 18:07 minutes to 57.52 minutes.

Before commencing with the focus groups, a participant information sheet was handed out to each participant who attended the session by a moderator. All participants were informed that there would be no right or wrong answers, that the focus would be on their perceptions and that every response or contribution would therefore add value to the research process. Written consent for participation was obtained for the interview and digital recording of the session. All participants were allocated a number on the recording and only their numbers were used when referring to them during data transcribing to ensure anonymity, thus protecting the identity of each participant. A moderator assisted with fieldnotes and observation during the interviews.

The sessions were digitally recorded and fieldnotes were taken to support the data gathered from the recordings. This allowed data triangulation as data from the digital recordings was triangulated with data collected from the fieldnotes (Tobin & Begley, 2004).

2.5.5.9 Semi-structured individual interviews

Semi-structured individual interviews, hereafter only referred to as individual interviews, were conducted with students and lecturers and clinical facilitators to explore more detail related to the phenomena under investigation (Longhurst, 2016). The individual interviews addressed the same research question and also provided more in-depth discussions around important experiences.

The interviews were conducted in a private room on the university premises. The sessions were digitally recorded and fieldnotes were taken to support the data gathered from the recordings. This allowed data triangulation, as data from the digital recordings were used to validate data collected from the fieldnotes (Tobin & Begley, 2004).

2.5.5.10 Fieldnotes during interviews

Fieldnotes are the observational notes recorded during the interview sessions to allow an understanding of the data collected, to serve as evidence and to develop an understanding of the culture, social situation, or phenomenon being studied (Schwandt, 2015). Various researchers provide guidance on what to observe during an interview session and how to take fieldnotes (Lofland, 2006; Spradley, 2016). Researchers observing the same events in the same setting do

not necessarily “see” the same things (Reid, Kamler, Simpson & Maclean, 1996). Fieldnotes taken by the moderator during interviews enhanced and supplemented the detailed recording of all occurrences. It afforded the researcher the opportunity after the interviews, to reflect on why, what, when and where the interviews were conducted and considered the non-verbal responses perceived from participants (Myers, 2013; Schwandt, 2015).

The collation of data and the analysis and the fieldnotes enhanced the meaning of the data collected (De Vos *et al.*, 2011). The researcher took part in the data collection in this research study, which allowed the creation of meaning from the engagement with the research data (Shattuck & Anderson, 2013).

2.5.5.11 Conceptualisation discussion group

A conceptualisation discussion group was held with lecturers and clinical facilitators to clarify the findings of the quantitative and qualitative data collected informing the development of the plan for the intervention. The interviews were conducted in a private room on the university premises. The conceptualisation discussion group was digitally recorded and fieldnotes were taken to support the data gathered from the recordings.

2.5.5.12 Reflection diary

Reflective journaling is a planned written process that guides on areas to be improved in teaching and learning perceptions of the past. Keeping a reflective journal or diary can demonstrate it advantageous when a need arises (Castleberry, Franks & Nolen, 2017). After every focus group session, individual interview and conceptualisation discussion group the researcher reflected on the process that was followed during data collection.

2.5.5.13 Transcribing qualitative data

All focus groups, individual semi-structured interviews with students and lecturers and clinical facilitators and the conceptualisation group with lecturers and clinical facilitators were digitally recorded. The digital recordings were transcribed verbatim by the researcher to ensure that transcriptions were accurate. The process of transcription afforded the researcher with an enhanced understanding of the data collected. The researcher coded every participant’s response during both the focus groups and the individual interviews to facilitate the transcription process.

Participants were assigned codes to ensure anonymity as follows: “Focus Group 2; Participant 2” but abbreviated as “FG 2; P2”, etc. For individual semi-structured interviews, the results will refer to e.g. “ISSI; P3”, etc. For the conceptualisation group, the results will refer to e.g. “Conceptualisation discussion group; Participant 3” but abbreviated as “CDG; P3. The data was also analysed by an independent coder who reviewed the data in order to confirm the themes and sub-themes identified by the researcher (Polit & Beck, 2018). Literature supported the data.

2.5.5.14 Data analysis

A data analysis, thematic open coding, based on the Tesch’s data analysis method (1990), as cited by Creswell (2003), was conducted on the following data collected from:

Student participants

- Focus groups sessions
- Individual semi-structured interviews
- Fieldnotes and reflections

Lecturers and clinical facilitators

- Focus group session
- Individual semi-structured interviews
- Conceptualisation discussion group
- Fieldnotes and reflections



The analysis (Tesch, 1990) as discussed in Creswell (2003) was done on each of these two groups:

1. All the transcribed individual semi-structured interviews were read to search for a sense of the whole in order to reflect on the overall meaning and general impression of all the participants in the study.
2. One of the most informative interviews was selected and read to formulate an understanding of the data by asking: “What is it all about?”

3. On completion of this process with all the interview transcripts, a list with all the identified themes was compiled. Similar themes were grouped together in columns using Microsoft Excel Spreadsheets.
4. All the identified themes were rechecked and compared to the data collected.
5. Descriptive words for the themes were identified. Related themes were grouped together to decrease the total list of sub-themes.
6. Abbreviations were used for each sub-theme and placed in alphabetical order.
7. The related data in each category were assembled in one area for the purposes of a preliminary data analysis.
8. No re-coding of the data was done as it was not requested by the independent coder.

Data analysis from the student groups yielded ten themes and 29 sub-themes, while the data analysis from the lecturers and clinical facilitators yielded five themes and 18 sub-themes (outlined in Chapter 5). Themes from the student groups included: mobile devices as a mode of communication; technology and web-based access; WhatsApp Messenger as a method of communication; email as a method of communication; Facebook as a method of communication; email, WhatsApp Messenger and Facebook as methods of communication; maintaining professionalism within the clinical setting; teaching and learning methodology; setting personal boundaries and other methods of communication. Themes from the lecturers and clinical facilitators included: affordances of mobile devices enhance teaching and learning; preferred methods of open dialogue/communication with students; concerns regarding an implementation using mobile devices; maintaining professionalism within clinical settings; structuring a m-learning intervention; and managing/guiding groups to ensure direction and cohesion.

2.5.5.15 Measures to ensure trustworthiness

Lincoln and Guba (1985), as cited in Polit and Beck (2018) draw a distinction between trustworthiness in qualitative research and reliability and validity in quantitative research and suggest four criteria for developing trustworthiness in qualitative inquiry.

2.5.5.16 Credibility

Credibility refers to confidence in the truthfulness of the data and ensuring that the data has been accurately interpreted and described (De Vos *et al.*, 2011). Credibility involves two aspects, which include executing the study in such a manner as to create believe-ability of the findings and following steps to ensure credibility of the research results. Credibility was achieved through further extended engagement with participants after focus groups and individual interviews in Phase 1. Credibility was strengthened through triangulation of data collection methods, and data analysis that enhanced the trustworthiness of the study. Students and lecturers and clinical facilitators were included in the interviews to explore the understanding around mobile learning and the integration of theory and clinical practice, related to the research objectives. Credibility was further enhanced by digitally recording all interviews, where after the recordings were transcribed verbatim of which an audit trail is evident.

2.5.5.17 Transferability

Transferability refers to the degree to which the findings of the study can be applied to or be appropriate for another group or setting. The researcher had the responsibility to provide enough descriptive data to place others in a position to evaluate how relevant the data will be in another context. Rich descriptions of the participants, the research setting, conducting focus groups and individual interviews were made in an attempt to provide evidence to be used by others (Polit & Beck, 2018). Transferability was ensured by allowing participants to review the transcriptions after the focus groups and individual interviews. In this way participants were granted the opportunity to review the researcher's understanding of the data collected and transcribed to contribute towards the trustworthiness of this study. The researcher made an explicit attempt to capture the perceptions of the participants through a process by which themes and sub-themes were identified from the transcribed interviews during the data analysis process. An independent coder also analysed the data and the themes and sub-themes were discussed with the researcher to obtain consensus (Polit & Beck, 2018). Extended engagement with participants during interviews strengthened the usefulness of the study in other settings (De Vos *et al.*, 2011).

2.5.5.18 Dependability

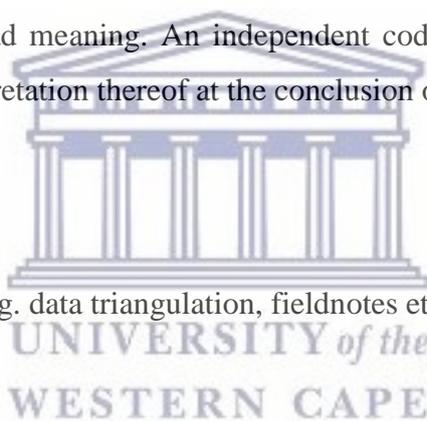
Dependability refers to the stability or reliability of the data over a period of time and in various situations. This implies that, should a research question be repeated with the same or similar participants in the same or similar context, the expectation would be that the results should be more or less the same. Throughout the research process, the researcher created an “audit trail” to ensure dependability; fortunately the need did not arise to verify data at any stage of the data analysis process with participants (Tappen, 2011). Dependability was further enhanced through verification of the research themes and sub-themes by an independent coder who confirmed the analyses of the research findings (Polit & Beck, 2018).

2.5.5.19 Confirmability

Confirmability was ensured with the use of two or more independent people to ensure that data was accurate, relevant and had meaning. An independent coder was approached to check the accuracy of themes and interpretation thereof at the conclusion of the study.

Reasoning strategies included:

- Inductive reasoning
- Deductive reasoning e.g. data triangulation, fieldnotes etc. (see Chapter 1)
- Reflexivity



An inductive research approach is concerned with the generation of new concept that emerges from the data collected and analysis during the research process. However, the focus of a deductive research approach is the testing of a principle through the collection and review of experimental evidence (Crossman, 2017).

2.5.5.20 Reflexivity

Reflexivity signifies the active acknowledgement by the researcher that her personal activities and decisions will unavoidably influence the meaning and context of the phenomena under investigation (Horsburgh, 2003). The researcher reflected on her own experiences throughout the research process using reflective journaling. The researcher also remained mindful of the purpose and objectives of this research study during the course of the study. In design-based research the researcher is part of developing and implementing the intervention.

2.5.6 Conclusion on the exploration phase

The knowledge gained from the exploration phase included insight into the perspectives of students and lecturers and clinical facilitators on m-learning, the need for using specific instructional strategies, and effective online instruction in an undergraduate nursing programme (Dabbagh & Bannan-Ritland, 2005).

The researcher as developer was provided with insight into the different aspects of the instructional and training challenges and facilitated the integration of various technological perspectives to produce information that guided the development of a successful online learning strategy. Thus, the data gathered and analysed during the exploration phase directed the effective use of an appropriate pedagogical model that was specific to the instructional strategies needed to implement the online learning environment during the enactment phase. The pedagogical perspectives that had to be taken into consideration for the integration included the beliefs of the developer, data collected on the process of learning, theoretical module content and the context. A learning perspective that was compatible with the views of the developer in developing specific learning strategies was selected. This verified that the design and development of the online learning strategy was grounded in the theories of teaching and learning.

This phase included the analysis of data collected from students and lecturers and clinical facilitators by the online learning developer (researcher), and it informed the next phase of the ILDF, which is the enactment phase.

2.6 THE ENACTMENT PHASE – PHASE 2

The enactment phase involved the implementation of the information gathered during the exploration phase. This information afforded the development and implementation of an effective online m-learning plan to enhance ITCP of the ENT health assessment in the PCCSM. Principles and practices followed in the enactment phase. The specific activities related to the enactment phase of Dabbagh and Bannan-Ritland (2005) included:

- Relate information gathered in the exploration phase to pedagogical models.
- Consider the instructional characteristics of the selected pedagogical models.
- Select specific instructional strategies and align them with the selected pedagogical models.

- Enact the instructional strategies by using the features of technological delivery systems.

2.6.1 Relate information gathered in the exploration phase to pedagogical models

The purpose of the enactment phase was to allow the online instructional developer to combine all the information collected regarding the student, course content and the HEI environment. The enactment phase allowed the design and development of appropriate, theoretically grounded recommendations for online instruction (Dabbagh & Bannan-Ritland, 2005).

2.6.2 Consider the instructional characteristics of the selected pedagogical models

A meticulous investigation into the instructional characteristics of the pedagogical models is needed in this phase. These characteristics should furthermore be aligned with the view of the online developer and subsequently the thinking and perceptions of students to ensure a successful online intervention. Norton (2003), as cited in Dabbagh and Bannan-Ritland (2005), identified situated learning as a pedagogical model since the following four characteristics relate to the perspective to learning. Situated learning:

1. promotes authentic learning through meaningful and purposeful activities representing “real-life” practices and situations;
2. provides opportunities to gain information on an identified problem;
3. promotes collaborative learning and creates opportunities for students to internalize, self-monitor, and self-correct with support; and
4. promotes the transference of “real-life” problem solving through authentic experiences.

These four characteristics served as a foundation for the implementation of the online WhatsApp Messenger used as a communication tool or strategy to enhance the integration of the theory and clinical practice of the ENT health assessment in the primary and clinical care module.

2.6.3 Select specific instructional strategies that align with the selected pedagogical models

On completion of the examination of the instructional characteristics of the selected pedagogical models, the online developer (the researcher) selected specific instructional strategies to enact using an online m-learning intervention with WhatsApp Messenger. The instructional strategy

was supported by constructivist models including situated, authentic, flexible, blended and case-based learning initiatives, as described in Chapter 7 (Dabbagh & Bannan-Ritland, 2005).

2.6.4 Enact the instructional strategies by using the features of technological delivery systems

During this stage, the online developer had to decide on the technological solution to be used, WhatsApp Messenger, to create the online learning environment. The technology deemed most appropriate for the online instructional strategy becomes the “vehicle” in delivering the instruction (Dabbagh & Bannan-Ritland, 2005).

In summary, the enactment phase provides the online learning developer with an opportunity to align his/her perspectives with established views of learning. The developer is guided in his/her review of the instructional characteristics of the various pedagogical models. The implementation of an online instructional strategy, using available technology, gives the developer the responsibility of problem solving and decision-making to ensure that the most appropriate instructional strategy for the context and student is selected (Dabbagh & Bannan-Ritland, 2005).

2.6.5 Activity Theory (AT) of Engeström

Engeström’s (1987) third-generation AT was applied in this research study to gain an understanding of the mediators of action and the contradictions which emerged. The activities communicated during the enactment and iterative cycles of the ILDF of Dabbagh and Bannan-Ritland (2005) are outlined in Chapter 8. Engeström (2001) specifies that there has to be some consideration of the relationships between the components of the activity theory and the interrelated activity systems. He established five principles to be adhered to, namely the mediating artefacts, community, subject, rules, division of labour, object and outcome.

First principle: The activity system is a collective, artefact-mediated and object-oriented unit of analysis. It is goal-directed individual and group actions that are eventually understood when interpreted against the background of the activity system (Engeström, 2001). In this study the activity was the use of WhatsApp Messenger, an application on smartphones, to communicate activities to students to enhance their integration of the theory and clinical practice of the ENT health assessment.

Second principle: The multi-voicedness of the activity system includes the community (students, lecturers, clinical facilitators and clinical facility staff) with diverse perspectives, reading traditions and wellbeing. The division of labour in the activity system leads to different situations, as each participant in a study has a unique background. The many individual voices and perspectives could prove challenging in an activity system and could be “a source of trouble and a source of innovation, demanding actions of translation and negotiation” (Engeström, 2001). In this study every participant was allocated a role. The researcher communicated the activity students had to view research and respond to the activities and clinical facilitators had to view the responses of students to guide where needed.

Third principle: The historicity of the activity system “takes shape and gets transformed” over extended periods of time (Engeström, 2001). The history of the activity and the object needs to be studied and analysed as the history of the traditional ideologies and tools shape the activity (Engeström, 2001). In this study the enactment took place over a six-week period.

Fourth principle: Central contradictions act as the driving force of change and development in the activity system. “Contradictions are historically accumulating structural tensions within and between activity systems” (Engeström, 2001). Activity systems are open systems that evoke a secondary conflict when a new component is adopted, e.g. the adoption of a new emerging technology that may collide with the norm. Although contradictions generate disturbances and conflict, they also create an opportunity to bring about innovative change (Engeström, 2001). During the three iterative cycles of the enactment, improvements were made to the plan as participants refined the principles during the enactment.

Fifth principle: The possibility of expansive transformations in the activity system that move through very long cycles of qualitative transformations may happen. At this stage, some participants may start questioning and deviate from the established norms that lead to collaborative envisioning and a deliberate collective effort to bring about change. A full cycle of expansive transformation may be understood as a collective journey through the zone of proximal development of the activity (Engeström, 2001). In this study students reflected on their experiences after every iterative cycle and the responses were positive regarding their integration of the theory and clinical practice of the ENT health assessment.

The distance between the present everyday actions of individuals and their new form of societal activity can be collectively generated as a solution to potentially be embedded in their everyday actions (Engeström, 1987). Collaboration in the activity system during each of the three iterative cycles of the ILDF was bound by rules which impacted behaviour (see Figure 2.8).

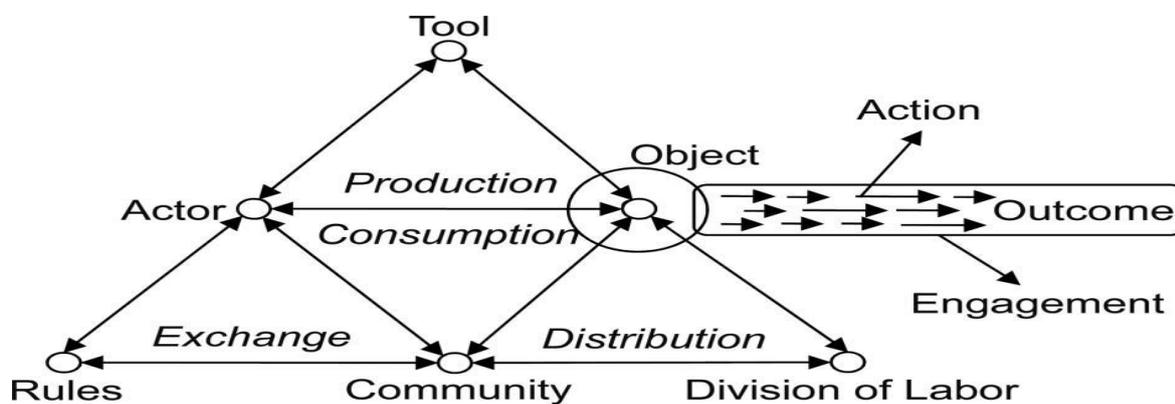


Figure 2.8: Complex structure of the activity system

(Source: Engeström, 1999, based on Engeström 1987)

It can thus be summarised that in an activity system, the nurse educator (subject) acts on the students' understanding (object) in order to transform the challenges identified (outcome) by using an online m-learning environment (mediating artefact) (Hardman, 2005).

The activities in the AT included: rules of engagement, object, tool or mediating artefact, actor, community and division of labour (discussion in Chapter 8).

During the division of labour, the actor ensured that the following principle was adhered to as illustrated in Table 2.9.

Table 2.9: Division of labour supported the affordance model of Bower (2008)

AFFORDANCE	DIVISION OF LABOUR – DISTRIBUTION
Accessibility	The lecturer and clinical facilitator had to be available within the WMG while the students were within clinical practice (08h30–16h30) to ensure accessibility.
Write-ability, readability, view-ability, speak-ability and listen-ability	WhatsApp Messenger, as the method of communication, provided services such as text messages, pictures, videos and voice notes.
Link-ability	WhatsApp Messenger provided a link or connection between students and lecturers and clinical facilitators and it was an affordable method of communication.

Focus-ability	WhatsApp Messenger allowed immediate responses by lecturers and clinical facilitators to activities focused on enhancing ITCP for students and lecturers and clinical facilitators.
Share-ability	Support was provided on a one-on-one, one-to-many or many-to-many basis, thus allowing contributions and collaborations, e.g. a WMG will be established to enable the sharing of information between students and lecturers and clinical facilitators.
Reliability	Students and lectures and clinical facilitators all had to follow the same rules of engagement to support reliability.
Permission-ability	Permission obtained from students, lecturers and clinical facilitators to participate in the intervention allowed the reading, uploading, viewing and administering of information lecturers and clinical facilitators.

Outcome: The outcome of this m-learning intervention is ITCP of the ENT health assessment in the PCCSM through m-learning.

There are four higher-order functions, referred to as production, distribution, exchange and consumption (Table 2.10), embedded within the AT model, arising from the mutual relationships among the nearest “neighbours” within the model (Holt & Morris, 1993; Nardi, 2007).

Table 2.10: Four higher-order functions of AT

Production	This is the starting point in the system and involves the creation of objects that correspond to the identified needs or anticipated objectives of the system.
Distribution	This refers to the division of the workload or activities in accordance with the rules of the community.
Exchange	This is the apprehension of the social communications from the initially agreed to distribution of activities, thus the distribution of tasks among all role-players.
Consumption	This is viewed as the end of the system and relates to the attainment of the objective within the community or the system by the subject.

In this study, a few assumptions regarding these functions were made. First, the people in an activity system are active participants who are continuously subjected to change and who see these changes as driven by incongruities (Engeström, 2001). Second, the examination of the AT and the concept of expansive learning were guided by the following four questions: “1. *Who are the subjects of learning?* 2. *Why do they learn?* 3. *What do they learn?* 4. *How do they learn?*” (Engeström, 2001). Third, within the diagram of the activity system of Engeström, (2008), suitable ICT tools (e.g. a smartphone with applications such as Mxit, WhatsApp Messenger,

Facebook, blogger, etc.) were selected for addressing the teaching and learning challenges identified, including their affordances, the pedagogical and instructional models, and the instructional strategies they support. This could be one or more than one tool, depending on the needs identified for the specific research purposes.

The enactment had three iterations (Objective 4) during which Objective 5 (reflections) were integrated. Therefore, the enactment phase and evaluation phase overlapped in this study.

2.7 THE EVALUATION PHASE – PHASE 3

The evaluation represented an assessment to establish if the purpose and objectives of the online learning design were effective and if they yielded the informative outcomes. The three phases of the ILDF were used to systematically explore, enact and reflect on the development of an online m-learning intervention, using WhatsApp Messenger, as support for third-year undergraduate nursing students to enhance their ITCP of the ENT health assessment in the PCCSM.

2.7.1 Principles and practices followed in the evaluation phase

Dabbagh and Bannan-Ritland (2005) identify the following specific activities in the evaluation phase:

- Clearly determining the purpose, desired results, and methods of evaluation for online learning. Using the AT of Engeström (2008) the enactment through the components of the activity system was systematically explored and evaluated to determine whether the purpose and objectives of this research study were achieved.
- Formatively evaluating the design and development prior to launching the online course. The developed online m-learning intervention was first presented in workshops to lecturers and clinical facilitators and thereafter to students, after which improvements were made. Only then was the intervention implemented (Chapters 7 and 8).
- Revising the online materials according to the results of the formative evaluation. The intervention was evaluated after each of the three iterations and improvements were made based on the electronic reflections received from students and clinical facilitators (Objective 5; Chapters 7 and 8).

- The online m-learning intervention using WhatsApp Messenger was implemented and evaluated to ensure that the purpose of this research study was adhered to.

2.7.2 Clearly determining the purpose, desired results and methods of evaluation for online learning

The evaluation of an online learning strategy has to be meticulous and systematic. A guiding framework is advised as it can offer the online developer the required results and appropriate method of evaluation (Dabbagh & Bannan-Ritland, 2005). In this study, the AT of Engeström (2008) was used as the framework for the evaluation process.

2.7.3 Formatively evaluating the design and development prior to launching the online course

During the iterative design and development, the formative evaluation process determined the strengths and weaknesses of the learning content of the online strategy implemented (Dabbagh & Bannan-Ritland, 2005). Students and clinical facilitators submitted electronic reflections as a formative evaluation after every iterative cycle. The feedback received indicated the strengths and weaknesses of the learning content of the online m-learning strategy.

2.7.4 Revising the online materials according to the results of the formative evaluation

The formative evaluation process (on completion of the iterative design and development) informed the revisions to be made (Dabbagh & Bannan-Ritland, 2005). The feedback in the form of electronic reflections was analysed and adjustments were made to the enactment prior to the next iteration.

2.7.5 Implementing the online learning experience and evaluating the results according to the identified goals

The results of or experiences from the design and implementation of the evaluation process provided the online m-learning strategy developer with insight into how to use a blended learning approach to teaching and learning to enhance the integration of the theory and clinical practice of the ENT health assessment (Dabbagh & Bannan-Ritland, 2005).

In summary, the evaluation process for online learning developers was aimed at providing useful information on how to use different methodologies and approaches to enhance students' learning experience (Dabbagh & Bannan-Ritland, 2005).

2.8 RESEARCH ETHICS

Three ethical principles regarding research with human participants include respect for people, beneficence and justice. Respect for people means that every person is autonomous, has the right to self-determination and the freedom to withdraw from a research study at any point. The focus of the principle of beneficence is to do no harm, but rather to do good. The principle of justice simply means that every person should be informed on the potential risks and benefits regarding their involvement in this research study (Burns & Grove, 2017).

2.8.1 Permission to conduct research

Ethical clearance for this study was obtained on 12 December 2012 from the Senate Higher Degrees Committee of the Faculty of the Community Health and Sciences (Annexure 2), the Dean of Research (Annexure 1 & Annexure 2) and the Director of a school of nursing (Annexure 3 & Annexure 4) at the relevant HEI. The project was also registered at the HEI where the study was approved (12/10/16). The research proposal was presented to a postgraduate committee in a school of nursing where the researcher is employed, and on approval from this committee, the research proposal was submitted to the Senate Higher Degrees Committee and the ethical clearance obtained. Permission was also obtained from the Director of the Western Cape Department of Health (Annexure 5 & Annexure 6) to conduct the study within identified health facilities.

2.8.2 Informed consent

After the purpose of the study and the expectations of the researcher were explained, written, informed consent was obtained from prospective participants prior to their involvement in this research study. Each participant received a hard copy of the participant information form (Annexure 7) and the consent form (Annexure 8). The purpose, guidelines to participate in the study and ethical considerations were outlined in the participant information form, while the contact details of the researcher, research supervisor and dean of the faculty were also provided in case any questions regarding the research should arise.

Participants in this study had to be prepared to give written, informed consent to a fieldworker to have their cell phone (mobile) number made available to the researcher. The researcher ensured

that the cell phone (mobile) numbers would not be shared with any other person other than the research supervisors.

2.8.3 Voluntary participation

Students and lecturers and clinical facilitators were informed that their participation in the study was voluntary. Participants were informed that they could withdraw from the study at any stage. Student participants were assured that their studies would not be negatively influenced should they decide to withdraw from the study. Each participant thus voluntarily completed the consent form (Annexure 8). The researcher informed participants that there were no direct or indirect benefits from participating in the study, apart from technical guidance and assistance while using mobile devices optimally to enhance their learning journey.

2.8.4 Anonymity and confidentiality

Participants were informed that their personal data would remain anonymous and confidential and that all information gathered would be for the purpose of this study, related conference presentations and publications in accredited journals only. Participants were informed that they could withdraw from the study at any stage of the research process without any consequences or implications to their studies. Anonymity of participants was assured by assigning a number to each participant and by referring to the numbers (and not names) during the data collection process of the study. Furthermore, no personally identifiable information was obtained. Confidentiality of all data related to the study participants was guaranteed by using coding for transcripts and digital recordings and by keeping the data in an encrypted file on the desktop computer in the office of the researcher for five years after the results are published. The transcripts of all data collected and the audio recordings will be destroyed after a period of five (5) years. Data files were protected with a password when stored on the computer of the researcher. The researcher, research supervisors, independent coder and statistician were the only individuals who could access data related to the study.

2.8.5 Privacy

Participants who consented to participate in the study had to be prepared to give written, informed consent to have their cell phone numbers made available to the researcher in this project. This enabled the researcher to facilitate the mobile intervention of the study.

2.8.6 The principle of beneficence

All research participants had to be protected from any form of harm (Burns & Grove, 2017). The researcher had to ensure that students were informed about safety principles and policies on the use of mobile devices within clinical facilities where they completed their clinical practice to prevent loss or theft of personal mobile devices. As the study focussed on a mobile learning intervention there was no harm as the current offering of the module was not evaluated or the researcher implied.

2.8.7 The principle of justice

The researcher informed participants that there would be no direct benefits other than an enhanced learning opportunity, technical guidance and assistance while using mobile devices optimally to enhance their learning journey. Links to all information shared with participants in this study were made available on the e-teaching platform of the HEI for all students registered for the ENT health assessment in the PCCSM in the third-year of the undergraduate community health nursing programme. This was done to ensure that no student participant in this research study would be disadvantaged. It was hoped that the use of mobile devices would enhance the learning of students by using a medium that they were able to access and use, and that was of interest to them.

2.9 DISSEMINATION OF THE RESEARCH RESULTS

The results of the study will firstly be available to students, lecturers and clinical facilitators that participated on request. It will continue to be, disseminated through presentations at regional, national and international conferences and publications in accredited peer reviewed journals (e.g. Willemse, Jooste & Bozalek, 2014; Willemse & Bozalek, 2015; Willemse, 2015).

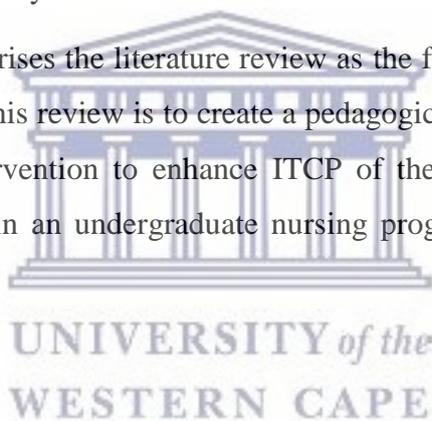
2.10 SUMMARY

This chapter has provided a description of the DBR methodology, and the ILDF (Dabbagh & Bannan-Ritland, 2005), of this study that were used to systematically realise the purpose and objectives of this study. The methodological framework was identified as most appropriate for this study as it contributed to the construction of an articulated, methodical, yet dynamic, structure. According to Dabbagh and Bannan-Ritland (2005), traditional design-based instructional design models are difficult to apply due to a lack of flexible “interactiveness” and

the lack of adaptability in the processes. The ILDF afforded the research study a flexible process of online design and development. The emphasis of the ILDF was on a constructivist social perspective of learning and design. The constructivist learning models facilitated the stimulation of meaningful learning through the systematic, iterative online design and development process (Dabbagh & Bannan-Ritland, 2005).

The ILDF, that focuses on the three phases that guided the study in a systematic manner and includes: the exploration (representing the analysis of the practical problems identified); the enactment (including the three iterative cycles of testing and refinement of solutions in practice); and the evaluation (attained through the reflective iterative cycles of testing and refinement of solutions in practice to produce design principles). Quantitative and qualitative exploratory approaches were followed. A description of how the trustworthiness of the findings and the ethical considerations of the study were ensured is included in the following chapter.

The following chapter summarises the literature review as the first step in the exploration phase of the ILDF. The purpose of this review is to create a pedagogical underpinning for the planning of a plan developed for intervention to enhance ITCP of the ENT health assessment in the PCCSM through m-learning in an undergraduate nursing programme at an HEI in the WCP.



3 CHAPTER: LITERATURE REVIEW



“Research is formalized curiosity. It is poking and prying with a purpose.” Zora Neale Hurston

3.1 INTRODUCTION

This chapter provides an overview of the literature on m-learning initiatives in HEIs, which the first phase of the ILDF outlined by Dabbagh and Ritland-Bannan (2005) – the exploration phase or situational analysis. The purpose of completing the literature review was to contribute to the design and development of an effective online m-learning intervention. The literature review made it possible to explore the affordances of m-learning and to confirm the pedagogical underpinning for the plan developed for intervention and implementation there off.

The following databases were consulted to search primary and secondary sources for the literature review: Ebscohost, SpringerLink, MEDLINE (Medical Literature Online), Academic Search Premier, Nexus, CINAHL (Computer Index to Nursing and Allied Health Literature), Science Direct, Scopus, Google, Google Scholar and other university library resources. A combination of keywords was used in the search that included: affordances, m-learning, mobile devices, emerging technology, teaching and learning, higher education, HEI, undergraduate nursing programme, nursing, students, educators, design-based research (DBR), authentic learning, flexible learning and Activity Theory (AT).

The chapter includes an overview of the learning theories appropriate for online instruction, and m-learning, m-learning in relation to nursing education, social media in m-learning and the affordances of social media applications.

The global use and connectivity capacity of mobile devices, in conjunction with the affordances of social media networks, provided a resource-rich platform for innovative student-directed learning experiences. Identifying the barriers for effective innovation in teaching and learning is important in the fast-paced changes in the globalised world (Serdyukov, 2017). The advancement and capabilities of mobile electronic devices make it possible to access

information in a hospital environment or within a community health facility, thus affording research regarding a condition within the clinical setting. The rapid advancement in medical technology enables the storage of information on mobile devices and facilitates searches for detailed clinical knowledge on conditions that may not be encountered daily (Vivekanantham & Ravindran, 2014). The International Telecommunication Union (May, 2014) estimates that there are nearly seven billion mobile subscriptions worldwide, which is equivalent to 95.5 % of the world's population (mobiforge.com).

It could be concluded that the increase in the acquisition of personal smartphones with all of their technological advancements can afford new instructional methods to teaching (Draft Design Principle 1, hereafter DDP 1).

3.2 MOBILE LEARNING

Traxler (2010, 2018) defines m-learning as “the provision of education and training on PDAs/palmtops/handhelds, smartphones and mobile phones”. M-learning is one of the fastest growing fields in research, with its globally described myriad of definitions and applications and its management illustrated in publications from varied disciplines (Babcock, 2010; Brooks-Young, 2010; Prensky, 2010). As the pioneers in m-learning, Traxler and Kukulska-Hulme (2016) have published guidelines on m-learning for educators and online trainers.

Some of the first publications on m-learning were by authors such as Ryu and Parsons (2009) writing “about providing a comprehensive survey of m-learning research and projects that both academics and practitioners may utilize in their work”. Ally (2009) brought together a group of academics from across the globe who discussed their perspectives on m-learning. A volume by Vavoula, Pachler and Kukulska-Hulme (2009) outlines the frameworks, tools and research designs for m-learning that have been adopted and adapted to present new models and a deeper understanding of m-learning. A textbook published in 2010 provides guidance to students as they learn about and how to interact with online and mobile technology (Stevens & Kitchenham, 2011).

It could be concluded that m-learning has been extensively researched by pioneers in the field to identify its affordances and this could be used to guide students as they learn (DDP 2).

Roberts, Rylands and Sinclair (2016) indicate that interventions in health care using mobile devices which include mobile phones, smart phones, or tablets to improve adherence to treatment for HIV or tuberculosis were important. A methodological review by Klasnja and Pratt (2012) recognises that mobile phones have become ubiquitous and established in the delivery of healthcare interventions. Zickuhr (2010) identifies that there were still noticeable differences by generations with online activities with millennials aged between 18-33 years remain more likely to access the internet wirelessly with mobile device (www.pewinternet.org, 2010). Examples of interventions using mobile devices include text messages to assist with quitting smoking (Haug, Schaub, Venzin, Meyer & John, 2013); providing health education by receiving mobile phone-based pharmacy information and other health technology services (Sankaranarayanan & Sallach, 2014); effective use of a short message service reminders at improve clinic attendance (Guy, Hocking, Wand, Stott, Ali & Kaldor, 2012); electronic health communication increase the importance of quality in treatment and patient safety (Herbek, Eisl, Hurch, Schator, Rauchegger, Kollmann, Philippi, Dragon & Seitz, 2012).

M-learning increases access to learning anywhere and anytime including when the students may not be on the physical premises of the learning institutions, thus making education according to students' own schedule possible. The portability of mobile technology enables learning at all times and in all places: during breaks, before or after clinical shifts, at home, or on the go (Valk, Rashid & Elder, 2010). Merzifonluoglu and Gonulal (2018) acknowledge that technology allows access to digital language learning and teaching, enabling access to an energetic centre of knowledge and learning resources.

It could be concluded that the significant increase in the use of mobile devices has made them ubiquitous and established in popularity as, among other factors, they provide access to learning at any time and at any place (DDP 3).

3.3 M-LEARNING: AN EMERGING TECHNOLOGY

Emerging technologies, including the use of mobile devices and social media applications, are becoming more frequently used in higher education pedagogies; this is also true for the health sciences (Bozalek, Ng'ambi, Wood, Herrington, Hardman & Amory, 2014; Wilson & Bolliger, 2013). Instructional methods of teaching have progressed from board and chalk, overhead

projectors and Microsoft PowerPoint lectures to the application of technology as a new method of instruction. Emerging technology affords students with an opportunity to visualise and interact with learning content using multimedia, rich graphics, animation, simulation and virtual environments (Madeira *et al.*, 2009). Veletsianos (2010) describes emerging technologies as tools, concepts, innovations and advancements used in diverse educational environments to fulfil different educational associated purposes. Educationalists, researchers and companies that develop learning systems and publish instructional material are increasingly displaying an interest in the use of m-learning (Uzunboylu, Cavus & Ercag, 2009).

Emerging mobile technology has created a dependency on smartphones, for example, as it has become integrated into every aspect of our daily lives. The size of mobile devices has, varied from handheld and pocket-size devices to iPads and laptop computers that can fit into handbags. There has been an increase in the use of mobile technology in health education and clinical monitoring also in developing countries (Nasi, Cucciniello & Guerrazzi, 2015). Smartphones are able to perform a number of computing activities in addition to the regular mobile phone functions, providing access to a camera, interfaces, Internet browsers, emails, text and instant messaging, Wi-Fi and Geographical Positioning System capabilities (Bajwa, 2014).

The New Media Consortium (NMC) Horizon Project (Johnson, Adams-Becker, Estrada & Freeman, 2015), with more than 13 years of research and publications, could be viewed as the world's longest-running exploration of the impact of emerging technologies on learning communities and the acceptance of emerging technological trends within the educational environment (Johnson *et al.*, 2015). Adams-Becker, Cummins, Davis, Freeman, Hall, Giesinger and Ananthanarayanan (2017) highlight six meta-categories in the 2017 NMC Horizon Report that reflect movements in the adoption of technology in higher education. With the *expanding access and convenience* of technology, individuals are expected to be able to learn and work at any place and at any time, with continuous access to learning materials and one another. The *spurring innovation* in higher education advances the culture of innovative thinking and the design of new forms of artificial intelligence. *Fostering authentic* pedagogical trends such as problem-based or case-based learning create a richer and more hands-on, real-world approach for students, thus promoting active learning over memorisation (Adams-Becker *et al.*, 2017).

Students are able to learn through active participation by creating and demonstrating their newly acquired skills in more concrete and creative ways, allowing them to become active contributors to the knowledge ecosystem. *Tracking and evaluating evidence* are important approaches as the tracking of a student’s performance, engagement and behaviour, and leveraging that data, inform decision-making. *Improving the teaching profession* emphasises on a more hands-on, technology-enhanced, student-centred learning approach has resulted in students inventing and collaborating regularly that caused a shift in the responsibility of educators from their position as “sage on the stage” to “guide on the side” (Adams-Becker *et al.*, 2017). In the *spreading digital fluency*, technology and digital tools have become ubiquitous, but they have to be integrated into the learning process in a meaningful way to be effective. Being “digitally-savvy” means that you have to be able to work with different types of technology as they emerge (Adams-Becker *et al.*, 2017).

The emergence of technological advancements guided Cochrane, Antonczak, Keegan and Narayan (2014) to differentiate between the roles of educators as stewards and practitioners responsible for steering higher education towards innovative and creative pedagogies. This can be achieved by moving away from teacher-directed pedagogy to a student-centred andragogy, in order to achieve student-determined learning (Heutagogy), termed the Pedagogy – Andragogy – Heutagogy (PAH) continuum. Mapping the PAH continuum onto a web-based technological development timeline results in what we call the post-Web 2.0 continuum. The post-Web 2.0 continuum (Table 3.1) represents a pedagogical change timeline reflecting key for technological development and its pedagogical affordances from the rise of the Internet, post-Web 2.0 and the virtually ubiquitous uptake of mobile devices such as smartphones and small format touch screens. Post-Web 2.0’s pedagogical affordances include the exploration of innovative teaching and learning practices and the embodiment of authentic learning practices through social connectivity (Cochrane *et al.*, 2014).

Table 3.1: The post-Web 2.0 continuum

Post-Web 2.0 continuum		
1995	2005	2013
Web 1.0	Web 2.0	Mobile
Teacher	Student e-portfolio	Collaboration
LMS	Student generated content	Connectivism

Content delivery	Slide share	Student generated contexts
PowerPoint	Andragogy	Mobile social media
Pedagogy	Social learning	Heutagogy; Creativity
	Building learning communities	Active participation in professional communities

Adapted from Cochrane et al. (2014)

Cochrane and Bateman (2010) identify the following benefits of m-learning using the mobile post-Web 2.0 pedagogical affordances for teaching and learning at an HEI:

- It allows exploration of innovative teaching and learning practices.
- It enables the embodiment of authentic learning practices such as facilitating learning anywhere at any time, while focusing on student-centred learning.
- It enables engagement with students with the affordances of mobile Web 2.0 technologies: connectivity, mobility, geolocation, social networking, personal podcasting, etc.
- It bridges the ‘digital divide’ by providing access to learning contexts and user-content creation tools that are affordable and increasingly owned by students.
- It enables moving from a model of fixed, dedicated, general computing to a mobile, wireless computing paradigm that turns any space into a potential learning space.

Based on the experiences gathered from fifteen m-learning trials over a three-year period, Cochrane and Bateman (2010) summarised a shortlist of factors that are critical for pedagogical success:

- a high level of pedagogical integration of the technology into the course criteria and assessment,
- an increase in the level of lecturers modelling of the pedagogical use of the tools,
- the use of regular formative feedback from both lecturers and student peers,
- appropriate choice of mobile devices and software,
- technological and pedagogical support.

Therefore, the integration of the mobile post-Web 2.0 technologies into teaching and learning practices (by incorporating them into course activities and assessments) is a critical factor, as it establishes a collaborative learning environment.

It could be concluded that the mobile post-Web 2.0 pedagogical affordances for teaching and learning enables engagement with students through a high level of pedagogical integration of the technology, increases in pedagogical use of the tools, regular formative feedback, and use of appropriate technology and providing technological and pedagogical support (DDP 4).

Williams, Cassella and Maskell (2017) indicate that forensic anthropology students were compelled to be accomplished at the technique of constructing an osteological profile of unknown human remains, to extend their knowledge and familiarity of the anatomy of the human skeleton. Instructing students in the human skeleton was approached in various ways, including traditional teaching methods such as the dissection of a donated cadaver, inclusion of technological resources providing links to anatomy image databases, application for anatomy revision and digital libraries. A blended learning approach enhanced the teaching and learning process through combining traditional methods with the use of low tech and reasonably inexpensive interactive technology, without compromising the quality of the teaching methodology. The digital generation was clearly “tech-savvy” and the advancements made in technology played a significant role in their daily lives (Williams, Cassella & Maskell, 2017).

Sumi, Etani, Felsy, Simonetz, Kobayashix and Mase (1998), cited in Kukulska-Hulme, (2016) describe their long-term impression of mobile assistance as the enhancement of communication and information sharing among individuals and “knowledgeable machines”, while creating a support model with a “life-like animated character” on a mobile device.

It could be concluded that emerging technologies have been described as tools, concepts, innovations and advancements that can afford students the opportunity to visualise and interact with learning content within diverse educational environments (DDP 5).

Gartner’s Hype Cycle (Fenn & LeHong, 2011) provides a graphic illustration of the maturity and adoption of emerging technologies and the relevant applications. The focus of the Hype Cycle is on strategic planning, innovation and emerging technology, highlighting technologies that impact professionals. It provides information on how relevant emerging technologies can be employed to solve real problems and furthermore offers an understanding of how technology or

relevant applications evolve over time. There are five key phases of a technology's life cycle as portrayed by the Hype Cycle (Fenn & LeHong, 2011), including innovation trigger, peak of inflated expectations, trough of disillusionment, slope of enlightenment and the plateau of productivity (Figure 3.1).

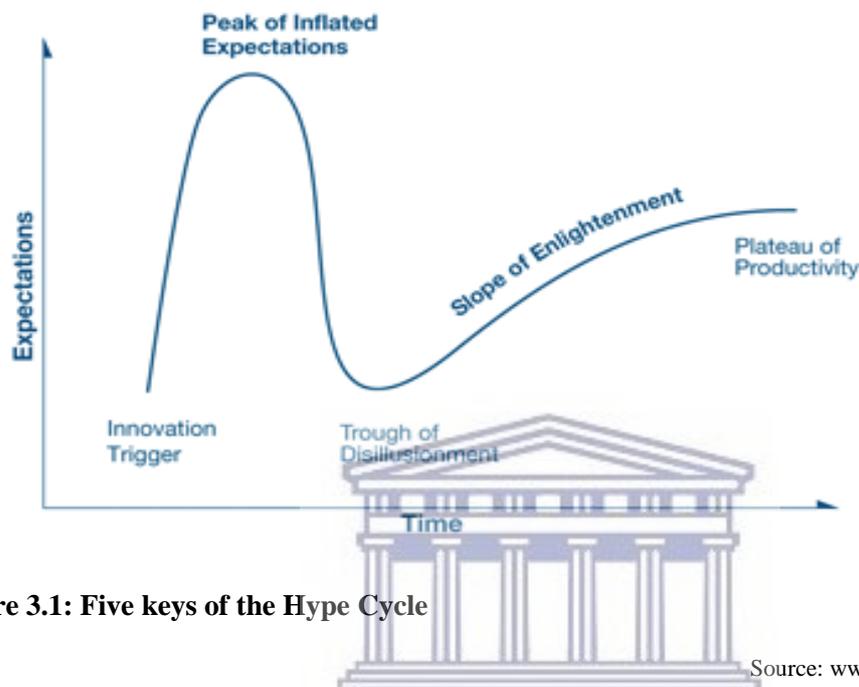


Figure 3.1: Five keys of the Hype Cycle

Source: www.gartner.com

1. **Innovation trigger** – the start of a potential breakthrough in an emerging technology; an initial concept idea drawing the attention of the media aimed at getting substantial publicity (Fenn & LeHong, 2011).
2. **Peak of inflated expectations** – the early media attention and subsequent publicity yields a number of success stories, which are often accompanied by failure rates (Fenn & LeHong, 2011).
3. **Trough of disillusionment** – interest in the potential breakthrough wears off as the experiments and the implementation thereof do not deliver what was promised. Those manufacturing the technology stop doing so and investments will only continue if there is an improvement in the product that is to the satisfaction of those who showed initial interest (Fenn & LeHong, 2011).
4. **Slope of enlightenment** – an emerging focus on how the technology can benefit the organisation and an insight into it. Second- and third-generation technological products

start to appear from providers. There is an increase in funding for pilot projects by organisations making technology an integral part of their experiences while traditional organisations remain cautious (Fenn & LeHong, 2011).

5. **Plateau of productivity** – mainstream acceptance of the technological product and clarification of the criteria assessing the viability of the provider. At this stage, it becomes evident that the applicability and significance of the comprehensive market starts to pay off (Fenn & LeHong, 2011).

The Gartner's Hype Cycle thus suggests that every technological development goes through the above-mentioned five stages before they can become productive technological tools. In higher education, selected academics have investigated the value of emerging technologies during the early days of innovation, "*innovation trigger*", while others postponed until the "*plateau of productivity*" was evident (Fenn & LeHong, 2011). In 2016 the Hype Cycle for Education identified that a toolbox specific to an institution with various emerging technologies can enhance the institution's personnel and organisational productivity (Lowendahl, 2016).

The Gartner's Top 10 Strategic Technology Trends for 2017 include a digital stethoscope with the ability to record and store the heartbeat and respiratory sounds of an individual. In the future, this stethoscope could function as an "intelligent thing" with the ability to collect substantial amounts of data that relates to diagnostic and treatment information. This artificial intelligence-powered doctor- assistance application would be able to provide the health professional with diagnostic support in real-time (Panetta, 2016).

It could be concluded that, with the introduction of emerging technologies, cognisance has to be taken of the five stages of the Gartner's Hype Cycle that technological development undergoes when preparing an intervention using an emerging technology (DDP 5).

3.4 M-LEARNING: A NEW LEARNING PARADIGM

HEIs are moving away from traditional methods of teaching and learning with the acceleration of technological innovations (Johnson, Adams-Becker, Cummins, Estrada, Freeman & Hall, 2016). In this contemporary era of technological advancements, it is evident that all spheres of society have been enhanced by technology. The use of technology has expanded into HEIs in the area of teaching and learning, including the area of health sciences, allowing for the expansion

of new teaching and learning models (Silva, Bariani, Kubo, Leal, Ilinsky, Borges, Faltin & Ortolani, 2017). Mobile technology has populated the world and permeated into developed and developing countries (Ng'ambi & Bozalek, 2016; Ng & Nicholas, 2016; Rushbrooke & Houston, 2015).

Technological tools such as smartphones, tablets and phablets have become increasingly personal, mobile and affordable with the abilities of a computer in the palm of your hand (Rushbrooke & Houston, 2015; Clark & Swanepoel, 2014). There has been a significant increase in the use of mobile devices as a platform to deliver healthcare interventions (Klasnja & Pratt, 2012). A methodological review by Klasnja and Pratt (2012) recognises that mobile phones have become ubiquitous and established in the delivery of healthcare interventions with the extensive proliferation of technical capabilities (Klasnja & Pratt, 2012). Pimmer *et al.* (2018) identified that mobile platforms used in nursing education allow connective qualities which are needed in clinical learning settings known for alienation, isolation and limit support to nursing students.

In this technologically advanced era, it is difficult and sometimes challenging not to be 'tech-savvy' as an educator at an HEI, as the global advancement in science and technology makes it difficult to remain indifferent to the presence of technology when individuals are singing the praises of the many technological gadgets they use on a daily basis (Madeira, Sousa, Pires, Esteves & Dias, 2009). Dahlstrom (2015) guides on faculty and student attitudes about technology show that about 72% of students believed that their educators had adequate technological skills to facilitate a course instruction and 68% of students indicated that their instructors used technology effectively to support their academic success. Madeira *et al.* (2009) report that emerging technologies afford students the opportunity to visualise and interact with learning content by using multimedia, rich graphics, animation, simulation, and virtual environments. While some studies have been conducted about the use of social media for higher education pedagogies, little has been written on learners' perspectives of these tools. There is therefore a need to investigate the perceptions of students using mobile devices to better ascertain how they might be used to enhance student learning and ITCP of the ENT health assessment in a PCCSM.

In 2011/2012 smartphones became the most used globally connected computer device when smartphone ownership outnumbered basic cell phone ownership (Cochrane, 2014). The

International Telecommunication Union (May 2014) estimated that there are nearly seven billion mobile subscriptions worldwide, which is equivalent to 95.5 percent of the world's population (mobiforge.com). There is an expected increase (Figure 3.2) in the number of smartphone users from the 1.5 billion indicated to around 2.5 billion by 2019. It is estimated that over 36% of the global population will use smartphones by 2018 (www.statista.com).

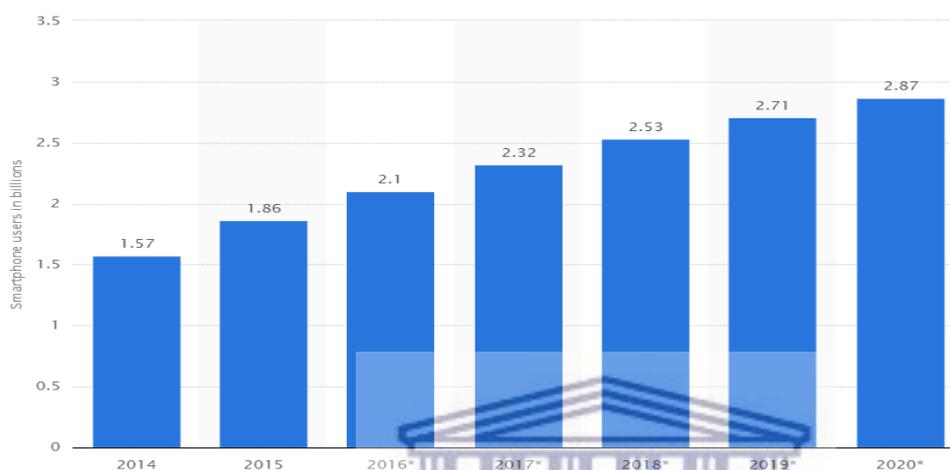


Figure 3.2: Global number of smartphone users from 2014 - 2020 (estimated in billions)

Source: www.statista.com

It could be concluded that the increase in the acquisition of personal smartphones, with all of their technological advancements, can afford new instructional methods to teaching. The significant increase in the use of mobile devices has made them ubiquitous and established in popularity, providing access to learning at any time and at any place (DDP 1 & DDP 3).

On 31 August 2016, Begna (2016:1) advised that incomprehensible advances can be expected in the field of technology in the years to come:

I've always found it funny how looking back on the history of technology can bring a sense of superiority and egotism on how much better things are right now. We've all been to an older relative's house and, on some level, felt that their landline telephone or turn dial TV was an indication as to how backwards they were living. Sure, the first car was created in 1886 and the first television in 1925, but purely from an overview of human history...that wasn't that long ago.

Benga (2016) writes that these advances are guided by the following three laws: Moore's law (1965), Kryder's law in Walters (2005) and Nielsen's law (1998).

Moore's law (1965) states that the processing power of a computer chip doubles almost every 18 months. In the early nineties, processing power was a major concern for many as it determined whether or not certain software could run on individuals' computers. Current processors such as Intel's core series (i3, i5, i7) allow individuals to watch movies, type documents and browse the Internet all at the same time without being concerned if the computer or smartphone is able to run all of those activities simultaneously. It is interesting that today's cell phones have more computing power than all of NASA during the 1969 Apollo mission.

Kryder's law (2005) explains that the storage capacity of devices doubles almost every year. About seven years ago, we were fascinated with the storage space of 8Gbs of data on an iPod. Today we have iPhones that are capable of storing 128Gbs of data – an increase of 1,600%. In addition to our phones, our laptops can now hold four terabytes (4,000 Gbs) of data (Benga, 2016).

Nielsen's law (1998) states that the speed of Internet bandwidth (Figure 3.3) doubles almost every twenty-one months. Benga (2016) refers to two words: Google Fibre. He also acknowledges the brilliant minds behind Google, the catalyst for incredibly high Internet speeds around the world. The average Internet speed in the United States of America is at 11.5 Mbps and with Google Fibre it is 1,000 Mbps. Google Fibre thus have the potential to ensure the expiration of slow Internet connections (Benga, 2016).

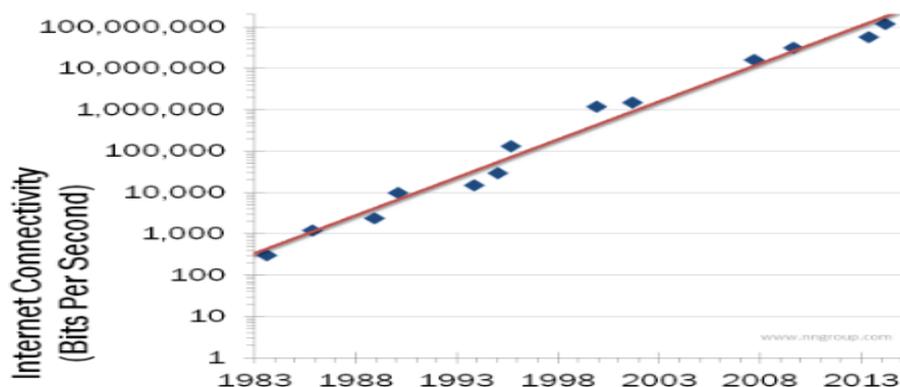


Figure 3.3: Increase in the speed of bandwidth (Internet)

Source: www.theodysseyonline.com

It could be concluded that the availability and speed of the Internet is of importance to students, lecturers and clinical facilitators while engaging in an innovative m-learning initiative (DDP 4).

3.5 MOBILE LEARNING IN HIGHER EDUCATION INSTITUTIONS

Present-day students at HEIs belong to the Millennial or Net generation as they have grown up within the digital era and are accustomed to communicate by means of various emerging technological platforms (Wilson & Bolliger, 2013). To effectively engage with students via emerging technological platforms in HEIs, educators would have to understand and exploit possibilities of integrating m-learning initiatives in their programmes (Sarrab, Elgamel & Aldabbas, 2012). There is exponential growth in m-learning research with more educators sharing their experiences on a worldwide platform (Sølvberg & Rismark, 2012).

The increase and integration of mobile technology in teaching and learning have led to individuals carrying their personal, small computers containing exceptional computing power such as laptops, personal digital assistants (PDAs), tablet PCs, cell phones, and e-book readers with them. The computing power and portability of these devices, combined with the wireless communication, affords teaching and learning practices with tools that have unlimited potential to be used effectively in both traditional classrooms and off-campus learning (Rambe & Bere, 2013; Sharples, McAndrew, Weller, Ferguson, FitzGerald, Hirst, Mor, Gaved & Whitelock, 2012; Sung *et al.*, 2016).

M-learning has become a new trend in the education sector, with an exponential acceleration in the variety of applications afforded by mobile devices (Aharony, 2014). Fundamentally defining m-learning is “learning with mobile devices”, which has the potential to extend the philosophies of learning through innovation (Gupta & Koo, 2010).

M-learning can be defined as an activity using a palm size mobile device that allow individuals interactivity or creating information with reliable Internet connectivity (Gupta & Koo, 2010; Wexler, Brown, Metcalf, Rogers & Wagner, 2008). The improved processing power of the latest mobile devices and tablets includes location identification, connectivity, memory, communication and interaction capabilities e.g. cellular phones, portable media players, electronic reading devices, iPods, palmtops, tablets, laptops, phablets, smartphones, smart watches and other wearable technologies (Al Mosawi & Wali, 2015).

Lee, Chae, Kim, Lee, Min and Park (2016) completed a randomized controlled trial on mobile-based video learning outcomes in clinical nursing skill education. The findings of the study demonstrated that a mobile device was an important technology in education that could be used to produce video clips to promote nursing students' confidence in learning a clinical nursing skill; motivation and confidence in viewing where improvements have been made (Lee, Chae, Kim, Lee, Min & Park, 2016).

The use of technology has become an important part in clinical experiences of student nurses. It is thus necessary for nursing schools to shift their paradigms with the integration of technology into the nursing curriculum and teaching environment to foster active and meaningful learning experiences. Williamson and Muckle (2018), document that the use of technology has become an important part in clinical experiences of nursing students. The relevance of using instant messaging during clinical placements, its determinants and the associated socio-professional indicators as being part of nursing students' inter-personal learning environments was established in a study on instant messaging and nursing students' clinical learning experience (Pimmer *et al.*, 2018). The importance for nursing schools to shift their paradigms with the integration of technology into the nursing curriculum and teaching environment to foster active and meaningful learning experiences was emphasised (Williamson & Muckle, 2018). Li, Lee, Wong, Yau and Wong (2018) identify in the study on the effects of mobile applications for nursing students that students and educators found the mobile applications helpful to facilitate social interaction. While in clinical placement facilities, peers and mentors were able to keep track of the students' learning experiences towards attaining their clinical outcomes through the performance record feature of the mobile application. This assisted in constructive communication in a way that was conducive to students' proficiency in clinical knowledge and skills (Li *et al.*, 2018).

It could be concluded that the preparedness of nursing students and their educators engaging in an innovative m-learning initiative is an important factor in ensuring the success of such an innovative intervention (DDP 6).

3.6 MOBILE LEARNING IN NURSING EDUCATION

Promoting the quality and effectiveness of nursing education is an important factor, given the increased demand for nursing professionals. It is important to establish learning environments

that provide personalised guidance and feedback to students regarding their practical skills and the application of their theoretical knowledge. The global increase in, and availability; and affordability of mobile devices have made them indispensable in day-to-day social networking. Such mobile devices are embraced by young people, giving them a sense of ownership while engaging with these devices (Pachler, Bachmair & Cook, 2010).

The American Association of Colleges of Nursing, the National League for Nursing and the Institute of Medicine, major forces in professional health care and nursing education, advocate the incorporation of mobile devices into nursing education for the integration of theory and practice (George *et al.*, 2010). Handheld technological devices or PDAs were effectively incorporated into nursing education programmes and provided students with a rich resource of reference material that was available and up to date. Almost 80 percent of students, who participated in this study incorporating mobile devices into nursing education for the integration of theory and practice, indicated that they successfully used PDAs as an educational resource in both the classroom and the clinical environment (George *et al.*, 2010).

Kenny, Van Neste-Kenny, Burton, Park and Qayyum (2012) assessed nursing educators' and students' self-efficacy related to their potential use of mobile technology and asked what implications this technology had for their teaching and learning in their practical education contexts. The researchers used an online cross-sectional survey design and respondents included students and educators from two nursing education programmes in a western Canadian college. A total of 121 educators and students completed the survey in January 2011. The results indicated a high level of ownership and use of mobile devices among the respondents. The high median mobile self-efficacy score (75 on a scale of 100) indicated that both educators and students were highly confident in their use of mobile technologies and were prepared to engage in m-learning.

It could be concluded that the preparedness of nursing students, lecturers and clinical facilitators to engage in learning with mobile devices could potentially extend the philosophies of learning through innovative m-learning initiatives (DDP 6).

3.7 MOBILE LEARNING IN TEACHING AND LEARNING

The lecturing method of disseminating information to students has proved to be ineffective as it does not incorporate active in-depth participation of students to enable them to construct meaning from the subject matter (Garrison & Vaughan, 2008). Palloff and Pratt (2007) reason that interactive and collaborative learning experiences are more compatible with achieving a higher-order learning outcome (Garrison & Vaughan, 2008). There has also been an increase in the use of mobile technology to enhance teaching and learning practices (Rambe & Bere, 2013; Sharples *et al.*, 2012). M-learning became a new trend in the education sector, with an exponential acceleration in the variety of applications afforded by mobile devices (Aharony, 2014; Gupta & Koo, 2010).

Mobile technology and social media could potentially improve the participation of students and professionals and link them between their varied geographically distribution by enabling communication on- and off-campus, improving collaboration and creativity, and by connecting students to experts in their field of study (McAndrew & Johnston, 2012). Applications available on smartphones not only provide access to information on health care but have transformed into an effective educational tool (Gavali, Khismatrao, Gavali & Patil, 2017).

The practice of teaching and learning is being improved and accelerated by mobile devices and the individual networks connecting individual people (Cook, 2010). Whether referring to informal or formal learning, m-learning has attracted the attention of educators and researchers in both schools and higher education (Cook, Pachler & Bradley, 2008; Cook, 2010).

It could be concluded that interactive and collaborative learning experiences afforded by mobile devices can improve teaching and learning, whether on a formal or informal platform, signalling a new trend within higher education (DDP 7).

Smartphones are at the forefront of technological advancement, merging the features of traditional mobile phones, PCs and the Web. Smartphones integrate not only technologies and platforms but also the personal practices, habits and modes of accessing media to communicate (Madianou, 2014).

The increased affordability, portability and functional convergence of technology have centralised the use of mobile devices, making them indispensable in the lives of users. Cook

(2010) recognises the need to re-examine approaches to the design of students' learning experiences that integrate the opportunities created by affordances of mobile devices within the learning context. Pachler *et al.* (2010) and Cook (2010) delineate three phases of m-learning: 1) a focus on mobile devices productively used with mobile technologies (e.g. e-books and handheld devices in classrooms); 2) a focus on learning outside the classroom, which can include bite-sized learning and personal learning organisers; and 3) a focus on the mobility of the learner where m-learning is designed to create an augmented reality.

Rushby (2012) specifies that research about m-learning can be divided into four areas: 1) pedagogy; 2) administrative issues and technological challenges; 3) ensuring sustainable development in education using m-learning; and 4) the impact of dealing with new applications. It is important to bear these factors in mind when designing pedagogical interventions in the HE context.

The concept of m-learning, or learning facilitated by mobile devices, has gained popularity in the developing world. The number of projects that explore the potential use of mobile technology for learning in the educational sector is steadily growing. These projects have expanded from short-term trials on a small scale to large-scale integration. The current study supports the exploration of how mobile phones can facilitate m-learning to contribute to improved educational outcomes through promoting *new learning*, and those new learning processes and new instructional methods are currently being emphasised in educational theory (Valk *et al.*, 2010).

Hattie and Yates (2014) indicate that computers are used effectively when (a) there is a diversity of teaching strategies; (b) there is pre-training in the use of computers as teaching and learning tools; (c) there are multiple opportunities for learning (e.g. deliberative practice, increasing time on task); (d) a student, not teacher, is in "control" of learning; (e) peer learning is optimised; and (f) feedback is optimised.

The insights of Hattie and Yates (2014) are relevant to this research study, which involve the integration of technology into the classroom and establishing a clear role definition of the educator in ensuring professionalisation with the adaptation in the teaching and learning approach. Clark and Luckin (2013) explain that educators should acquire the necessary technological and pedagogical skills to facilitate the integration of innovative technology into

classroom practices. The results of a study by Montrieux, Vanderlinde, Schellens and De Marez (2015) indicate that policy makers should consider introducing technical and pedagogical support to both educators and students to facilitate an understanding of the full potential of introducing technology into education.

It could be concluded that m-learning includes a focus on the affordances of the device and a focus on learning at any time or any place and technological and pedagogical skills support for students, lecturers and clinical facilitators to facilitate the integration of innovative technology in the classroom (DDP 8).

3.8 THE PROCESS OF LEARNING: THEORIES AND APPROACHES

Learning has commonly been denoted as the attainment of knowledge and skills, but has broadened as it also includes emotional, social and societal dimensions (Illeris, 2009). Learning is a lifelong and dynamic process that allows individuals to acquire new knowledge that transforms their thoughts, feelings, attitudes and actions (Braungart, Braungart & Gramet, 2014). Learning can be defined as a process of permanent change in intellectual processing, emotional functioning and behaviour as a result of an experience through which individuals acquire knowledge about the world (Braungart *et al.*, 2014; Illeris, 2007; Kimble, 1961; Woolfolk, 2010). Illeris (2007) defines learning as “any process that in living organisms leads to permanent capacity change and which is not solely due to biological maturation or ageing”.

It is important for an online developer to be aware of the different approaches to learning, to be able to select the most appropriate instructional strategies for an online enactment (plan and implementation). The purpose of learning strategies should be to motivate learners, facilitate deep processing, build the whole person, cater for individual differences, promote meaningful learning, encourage interaction, provide feedback, facilitate contextual learning, and provide support during the learning process (Anderson & Elloumi, 2004).

Many theories with different approaches, epistemological platforms and content, exceeded by new knowledge and philosophies, have emerged in the latter part of the 19th century. Currently we experience an extraordinary diversity of theoretical approaches to learning and constructions that relate to the global academic trends (Illeris, 2009).

It could be concluded that learning – a process through which permanent intellectual skills are acquired through innumerable experiences – occurs through engagement with the different approaches to learning (DDP 9).

Dabbagh and Bannan-Ritland (2005) illustrate different learning theories and the implications for instruction, as adapted in Table 3.2.



Table 3.2: Learning theories and the implications for instruction

Learning theory	Learner's role	Instructor's role	Implication for instruction
Behaviourism	To be a passive recipient of information, to respond to a stimulus	To provide a stimulus and reinforcement, to be a transmitter of knowledge	Use principles of reinforcement to strengthen or weaken existing behaviours Use shaping, chaining and fading to teach new behaviours
Cognitive information processing (CIP)	To use learning strategies to facilitate encoding	To support the learners' use of learning strategies	Provide organised instruction Arrange extensive and variable practice Enhance the learner's self-control of information processing Use Gagnés "events of instruction"
Meaningful reception learning (MRL)	To activate prior knowledge	To help the learner activate prior knowledge	Activate the learners' prior knowledge Use analogies and metaphors Use advances organisers (comparative and expository) Make instructional materials meaningful
Schema theory	To actively organise past experience to interpret new content	To identify misconceptions in the learner's schema, to provide opportunities for restructuring	Identify learners' existing mental models Provide conceptual models to make instructional material meaningful
Situated learning	To actively negotiate personal perception with the external world, to be a primary meaning maker, to take ownership of the learning process	To be a facilitator, guide, coach and mentor, to create scaffolds for learning, to create a resource-rich learning environment	Provide open-ended learning environments that support multiple perspectives, discovery learning, inquiry-based learning, experiential learning, social interactions, role playing, debates and authentic context Examples include the following: situated learning or anchored instruction, problem-based learning, cognitive apprenticeships, cognitive flexibility hypertexts, community of practice or learning communities, CSILEs, microworlds, simulations and VLEs

It could be concluded that after a review of the various learning theories presented in Table 3.2 assumptions of situated learning theory would be appropriate for this study with a constructivist epistemological orientation that indicates the roles of the student (learner) and instructor, as well as the implications for instruction (DDP 10).

3.9 THEORIES OF LEARNING RELEVANT TO MOBILE LEARNING: SOCIAL CONSTRUCTIVISM AND SITUATED LEARNING

Generally, social constructivism and situated learning appear to be the most appropriate learning theories that relate to m-learning (Brown, 2009). Naismith *et al.* (2004) indicate that constructivist learning gives students the opportunity to develop their experiences and enables the conceptualisation of new information based on their past and current knowledge.

3.9.1 Social constructivism

There has been a shift in educational paradigms that includes the move from constructivism to social constructivism and from knowledge production to knowledge configuration (Kukulsk-Hulme, Evans & Traxler, 2005). Zimmerman (1994) describes constructive learning as a self-regulated *process* rather than a focus on the *product*. This perspective emphasises that “individuals are meta-cognitively, motivationally and behaviourally active participants in their own learning process” (De Corte, 2010). Learning implies a change in the individual as a result of some intervention. It may be viewed as an outcome or as a process (Belkin & Gray, 1977). The United Nations Educational, Scientific and Cultural Organisation (UNESCO) (2013) believe that mobile technology has the potential to expand and enrich educational prospects for learners (henceforth referred to as students) in diverse settings.

Lev Vygotsky (1896-1934) maintain that social interaction plays an important role in the cognitive development of the student. He focused on the student as a product of his/her dynamic social interaction. Vygotsky's work indicated that social interaction plays an important role in the development of cognition. Cognition should be applied equally to voluntary attention, to logical memory, and to the formation of concepts (Vygotsky, 1978). From a Vygotskian perspective, the teacher's role is to mediate children's learning activity as they share knowledge through social interaction (Dixon-Krauss, 1996).

Every function in the child's cultural development appears twice: first, on the social level, and later, on the individual level; first, between people (interpsychological) and then inside the child (intrapsychological). This applies equally to voluntary attention, to logical memory, and to the formation of concepts. All the higher functions originate as actual relationships between individuals. (Vygotsky, 1978:57)

The major theme in the Vygotskian theoretical framework (1978) is that social interaction and culture play important roles in the development of cognition. There are four assumptions underlying the Vygotskian framework, namely: 1) students construct their own knowledge; 2) development cannot be separated from its social context; 3) learning can lead to cognitive development; and 4) language plays a central role in cognitive development.

The two main principles underlying the Vygotskian framework include the more knowledgeable other (MKO) and the zone of proximal development (ZPD). The ZPD (Wood, Bruner & Ross, 1976) refers to the distance between what the learner can achieve individually and what the learner can achieve with support. *Through scaffolding guidance*, by modelling a skill, providing hints or cues, and adapting material or activities, a teacher can create a deeper cognitive understanding of the *elements of the task that were initially beyond the student's capacity, thus improving competence*. The ZPD has become synonymous with the term “scaffolding” in the literature, however, it is important to clarify that Vygotsky never used the term “scaffolding” in his writing; it was introduced by Wood *et al.* (1976).

The following guidelines for scaffolding instruction (Silver, 2011) can be considered: assess the student's current knowledge and view of the academic content; relate content to what students already understand or can do; break a task into smaller, more manageable tasks with opportunities for intermittent feedback; and use verbal cues and prompts to assist students (McLeod, 2012).

The MKO refers to any person (whether peer, educator or other adult), who demonstrates a better understanding or higher cognitive ability than that of the student (learner) (Vygotsky, 1978). It can also refer to the technological affordances of a mobile device. Vygotsky observed the roles of instruction and assessment while focusing on assessing the methods by which students make progress. It goes without saying that internalisation transforms the process itself and changes its structure and functions. Social relations or relations among people underlie all higher functions and their relationships (Vygotsky, 1981).

Reciprocal teaching, on the other hand, is a modern application of the Vygotskian theory that is used to improve the student's' ability to learn from text. This method allows the teacher and students to collaborate in learning and practising four key skills, namely summarising, questioning, clarifying and predicting. The teacher's role in this process is reduced over time

(McLeod, 2012). Vygotsky's theory (1978) complements Bandura's (1977) work on social learning and is a key component of the situated learning theory.

It could be concluded that the two main principles underlying the Vygotskian Framework are MKO and the ZPD. The principles underlying the Vygotskian (1978) framework include the student's' ability to construct their own knowledge, while acknowledging that their development cannot be separated from their social context and be facilitated by a more knowledgeable other to that their learning can lead to cognitive development and their language plays a central role in their cognitive development (DDP 11).

3.9.2 Situated learning

Lave and Wenger (1991) state that learning is situated as it normally occurs as a function of the activity, context and culture in which it occurs. Situated learning is generally unintentional rather than a deliberate intervention or action. Social interaction is an important element in situated learning as students become actively involved in a "community of practice", which emphasises common goals whereby certain beliefs and behaviours can be acquired during skill and knowledge acquisition. Situated learning theorists Brown, Collins and Duguid (1989) explain that cognitive apprenticeship supports learning in an area by enabling students to acquire, develop and use cognitive tools in authentic domain activity (www.instructionaldesign.org).

Lave and Wenger (1991) describe learning as a situated activity with a central defining characteristic, which is a process called legitimate peripheral participation. Students inevitably participate within communities of practitioners who have acquired a mastery of knowledge and skills required for new students to move towards full participation in socio-cultural practices of a community. Legitimate peripheral participation provides a platform in which knowledgeable and skilled practitioners and new students can interact about activities, artefacts and communities of knowledge and practice, enabling the new learner to become part of the community of practice (Lave & Wenger, 1991).

Situated learning as explored in the work of Gibson (1979), relates to the theory of affordances and is related to Vygotsky's (1978) notion of learning through social development. The Cognition and Technology Group at Vanderbilt (1996) applied situated learning in the context of technology-based learning activities for schools, focusing on problem-solving skills.

It could be concluded that situated learning is a general theory on the acquirement of knowledge, related to the theory of affordances and Vygotsky's notion of learning through social development (DDP 10 & DDP 11).

Theorists of situated learning reason that this model for teaching, combined with practical applications, could be more readily implemented within the classroom (Brown, Collins & Duguid, 1989; Collins, 1997; Collins, Brown & Newman, 1989 in Herrington & Oliver, 2000). One of the critical aspects of situated learning is the concept of the student observing experienced professionals within the “community of practice” (Herrington & Oliver, 2000). Lave and Wenger (1991) suggest that participation in a culture of practice can initially be through observation, and as learning and involvement within the culture increases, the participant moves from the role of observer to a fully functioning part of the community of practice.

Students participating in an intervention to enhance the integration of the theory and clinical practice of the ENT health assessment in the PCCSM through m-learning would thus first have to observe the ENT health assessment. As their knowledge and clinical skill increase (while participating in the ENT health assessment under direct supervision of their lecturer, clinical facilitator or registered nurse at the clinical facility), they could practice until they are able to complete the procedure successfully and integrate the theory and clinical practice.

It could be concluded that all the elements of a situated learning theory could enhance the learning process of students within their community of practice (DDP 10).

3.10 'BRING YOUR OWN DEVICE' (BYOD)

A review of the literature by Cochrane *et al.* (2014) emphasises the existence of a few well-developed theoretical frameworks supporting creative pedagogies where participants have to BYOD in order to be participative. Supporting creative pedagogies using BYOD (through the inclusion of collaborative practice with the established teacher communities of practice) enhance learning about the affordances of mobile devices in relation to new models of student learning. The affordances of mobile devices, coupled with the collaborative affordances of social media, provide a rich platform for creative student-directed learning experiences.

It could be concluded that there is value to BYOD in order to be participate in research (DDP 12).

3.11 THE AFFORDANCES OF MOBILE LEARNING

3.11.1 Historical origin of the concept of affordances

Gestalt psychologists identified the meaning or value of an object as linked to the colour of that particular object (Gibson, 1967). Koffka (1935), as cited in Gibson (1967:7), wrote that “*each thing says what it is ... a fruit says ‘eat me’; water says ‘drink me’; thunder says ‘fear me’...*”

These viewpoints were focused and significantly related to the features of the experience itself. Koffka (1935) did not believe that this kind of association could be explained as a lifeless set of response tendencies, e.g. “the post box ‘invites’ the mailing of a letter”, which he called ‘demand character’, things that tell us what to do with them. The concept affordance is derived from the concept valence, invitation and demand (Koffka, 1935).

Salomon (1993), as cited in Conole and Dyke (2004), refers to ‘affordances’ as the perceived and actual properties of an object, primarily the functional properties, that determine just what and how the object could possibly be used. Gibson (1979) and Bower (2008) provide the following first known definition of ‘affordances’: “The affordances of the environment are what it offers the animal, what it provides or furnishes, either for good or ill. The verb to afford is found in the dictionary, but the noun affordance is not. I have made it up. I mean by it something that refers to both the environment and the animal in a way that no existing term does. It implies the complementarity of the animal and the environment.”

It could be concluded that the affordances of mobile devices lean to what mobile devices have to offer to the user of that device (DDP 3).

3.11.2 Concept of affordances according to Bower (2008)

Bower (2008) matches teaching and learning tasks with appropriate learning technologies by looking at the action potential of the technology. The dynamic model of Bower (2008) enables a better understanding of how teachers identify the value of different kinds of knowledge in an attempt to support students’ ability to learn content knowledge. The categories of mobile technology affordances provided a framework for the data analysis in this exploration of such affordances in integrating theory and clinical practice in an undergraduate nursing programme.

The affordance framework presented in Table 3.3 defines not only technological affordances but includes social and educational affordances.

Table 3.3: Classification of affordances

Number	Categories of affordances	Action possibilities
1	Media affordances	Readability, write-ability, view-ability, draw-ability, listen-ability, speak-ability, watch-ability, video-production-ability
2	Spatial affordances	Resize-ability, move-ability
3	Temporal affordances	Accessibility, record-ability, playback-ability, synchronicity
4	Navigational affordances	Browse-ability, link-ability, search-ability, data-manipulation-ability
5	Emphasis affordances	Highlight-ability, focus-ability
6	Synthesis affordances	Combine-ability, integrate-ability
7	Access-control affordances	Permission-ability, share-ability

Source: Adapted from Bower (2008)

It could be concluded that mobile technology has affordances to potentially guide the teacher on how to support student learning with the use of WhatsApp Messenger, a cross-platform mobile messaging application, on mobile devices (DDP 1, DDP 3, DDP 5 & DDP 8).

3.12 THEORETICAL PERSPECTIVES

The increased impact of social constructivism as a philosophical approach to learning has prompted many educators at universities to implement more authentic, flexible and blended teaching and learning environments (Herrington & Herrington, 2006). In this study, a social media application facilitated an authentic, flexible and blended teaching and learning environment, thereby creating learning opportunities for students which benefitted them at the time and which they could tap into once they had left the learning institution to apply the theory at clinical practice facilities (Herrington, Reeves & Oliver, 2014). The focus of this research study was engaging in innovative and realistic tasks in the PCCSM creating opportunities for complex collaborative actions for authentic learning to occur (Herrington *et al.*, 2014). The theoretical perspectives emulate constructivist epistemology with the emphasis on collaboration to enhance ITC.

It could be concluded that the creation of authentic, flexible and blended learning environments could form a foundation for pedagogical m-learning activities (DDP 13, DDP 14 & DDP 15).

3.12.1 Authentic learning

M-learning also facilitates designs for authentic learning spaces, suggesting learning that targets real-world problems and involves projects of relevance and interest to the learner (Kukulskahulme & Traxler, 2005; Traxler, 2007; Valk *et al.*, 2010). Mobile phones theoretically make learner-centred learning possible by enabling the students to access information in order to construct skills and knowledge, thus ensuring educational success (Sharples *et al.*, 2007; Valk *et al.*, 2010). M-learning thus enables the learners to take greater responsibility for their own learning processes instead of being passively fed information by the educator (Valk *et al.*, 2010). An authentic assessment is important and the assessment should be flawlessly integrated within the activity. The assessment also has to provide the students with an opportunity to be effective performers with acquired knowledge, and to enable them to share their knowledge with others (Duchastel, 1997; Reeves & Okey, 1996; Herrington & Herrington, 1998 in Herrington & Herrington, 2006).

Herrington and Oliver (2000) define authentic learning as experiences with the objectives to establish knowledge and skill within a real-life setting and to allow the students to make connections between the learning environment and the demands of their broader communities. Nine (9) characteristics of the authentic learning design principles are illustrated in Table 3.4.

Table 3.4: Characteristics of authentic learning

1.	Authentic contexts that reflect the way the knowledge will be used in real life
2.	Authentic activities that are complex, ill-defined problems and investigations
3.	Access to expert performances enabling modelling of processes
4.	Multiple roles and perspectives providing alternative solution pathways
5.	Collaboration allowing for the social construction of knowledge
6.	Opportunities for reflection involving metacognition
7.	Opportunities for articulation to enable tacit knowledge to be made explicit
8.	Coaching and scaffolding by the teacher at critical times
9.	Authentic assessment that reflect the way knowledge is assessed in real life

(Adapted from Herrington & Oliver, 2000)

It could be concluded that the aim of authentic learning is to establish knowledge and skill within a real-life setting, guided by the nine (9) characteristics of the authentic learning design principles (DDP 13).

3.12.2 Flexible learning

Flexible learning is a set of educational philosophies and systems that seek to provide students with increased choice, convenience, and personalisation to suit each individual student. In particular, flexible learning provides students with choices about where, when, and how their learning occurred (Shurville, O'Grady & Mayall, 2008). With the advent of PHC, client care has shifted from a hospital to a community-based environment, requiring educators to focus on new approaches and tools to support their teaching and learning in the autonomous and diverse practice environment where resources are not readily accessible (Kenny *et al.*, 2009). Because students in this study, were placed at clinical facilities two days per week, educators had to find 'alternatives' to their teaching strategies, with the aim of affording students the opportunity to explore where, when, and how they could manage their learning. This would be to enable students to communicate questions regarding their experiences at clinical facilities, in order to get clarification from their educators when they were not present at the clinical facility.

It could be concluded that within a flexible learning environment the objective is to provide students with increased, improved choices to suit the learning needs of every individual student (DDP 14).

3.12.3 Blended learning

Technological advancement has prompted interest in blended learning environments wherein interactive and learning experiences can be generated (Garrison & Vaughan, 2008). Blended learning can be defined as a combination of face-to-face and online learning experiences. It is important that both methods are optimally integrated in the learning experience by focusing on their individual strengths. The key assumptions of blended learning include:

- thoughtful interaction with face-to-face and online learning,
- fundamentally rethinking the course design to optimise student engagement,
- restructuring and replacing traditional class contact hours.

A blended learning approach following the community of inquiry framework or model, could guide the complex nature of teaching and learning within the PCCSM (Rowe, Frantz & Bozalek, 2013).

WhatsApp Messenger has been found to be beneficial for learning because of the increase in student participation in both face-to-face and distant contexts between students, other students, and educators (Johnson *et al.*, 2015; Makoe, 2012; Nicholson, 2002; Rambe & Bere, 2013).

It could be concluded that a combination of face-to-face and online learning experiences, namely blended learning, could create improved interactive learning experiences for students (DDP 15).

Emerging technologies provide the opportunity to visualise and interact with learning content (Madeira *et al.*, 2009). To achieve this, nursing students, lecturers and clinical facilitators should be prepared to interactively and collaboratively focus on learning opportunities afforded by mobile devices. M-learning focuses on the affordances of the device and on learning as a process in which permanent experiences through engagement are prominent. The focus of this study was on the affordances enabled by WhatsApp Messenger on mobile devices. The role of the student, lecturer and clinical facilitator and the implications for instruction should be clear by applying the principles of the Vygotskian framework (1978), which includes the more knowledgeable other (MKO) and the ZPD. The mobile Web 2.0 (Cochrane *et al.*, 2014) pedagogical affordances for teaching and learning enable engagement through Internet connectivity, mobility, geolocation and social networking. One of the inclusion criteria of the study is to BYOD (Cochrane *et al.*, 2014).

3.13 CONCLUDING STATEMENTS IDENTIFIED AS DRAFT DESIGN PRINCIPLES

This study focuses on Bower's concept of affordances (2008), guiding the matching of teaching and learning tasks to appropriate learning technologies through exploration of the action potential of the technology. Important conclusions have been drawn from the literature, related to how educators identify invaluable variations in knowledge formation in an attempt to support the students' ability to learn content.

Draft design principles identified from the literature review (Table 3.5) will guide the development of the planned intervention (Chapter 6), supported by the affordances of Bower (2008) and the pedagogical models for every draft design principle identified.

Colour key chart

	Authentic learning		Situated learning		Flexible learning		Social Constructivism		Blended learning
--	--------------------	--	-------------------	--	-------------------	--	-----------------------	--	------------------

Table 3.5: Rules identified as draft design principles

DRAFT DESIGN PRINCIPLES	AFFORDANCES	EMOTICON
Personal smartphones with all their technological advancements can afford new instructional methods to teaching, for example in the ENT.	Accessibility	
M-learning could be used to guide students as they learn.	Accessibility	
Mobile devices provide access to learning at any time and at any place.	Accessibility Movability	 
The mobile Web 2.0 pedagogical affordances for teaching and learning enable engagement with students through Internet connectivity, mobility, geolocation and social networking.	Accessibility Link-ability Search-ability	  
Emerging technologies provide the opportunity to visualise and interact with the learning content within a diverse educational environment.	Readability View-ability Browse-ability	  
It is important to prepare the nursing students, lecturers and clinical facilitators to be engaged in an innovative m-learning initiative to ensure the success of such an innovative intervention.	Accessibility	
Interactive and collaborative learning experiences afforded by mobile devices are a new trend within higher education that can improve teaching and learning, whether on a formal or informal platform.	Accessibility Share-ability	 

	M-learning focuses on the affordances of the device and on learning at any time or any place.	Accessibility Movability	
	Learning is a process through which permanent intellectual skill is acquired via innumerable experiences by engagement with the different approaches to learning.	Accessibility	
	Situated learning would be the appropriate learning theory for this study with the constructivist epistemological orientation that indicates the role of the student (learner), lecturers and clinical facilitator (instructor) and the implications for instruction.	Accessibility	
	The two main principles underlying the Vygotskian Framework include the MKO and the ZPD.	Link-ability	
	The value of BYOD in order to participate in a research study has been identified as important.	Accessibility	
	The aim of authentic learning is to establish knowledge and skill within a real-life setting, guided by the nine (9) characteristics of the authentic learning design principles.	Integrate-ability	
	The objective of a flexible learning environment is to provide students with increased improved choice to suit the learning needs of every individual student.	Integrate-ability	
	A combination of face-to-face and online learning experiences, namely blended learning, could create interactive learning experiences for students.	Integrate-ability	

(google.co.za/search?q=pictures+of+whatsapp+emoticons;

pinterest.com)

3.14 SUMMARY

This chapter includes the findings of the literature review that afforded the identification of draft design principles to inform the quantitative phase (*Objective 1*). The literature review aimed to

identify the affordances of m-learning to enhance ITCP of the ENT health assessment in the PCCSM through m-learning in an undergraduate nursing programme at an HEI in the WCP. It was highlighted that a combination of m-learning and the use of social media applications could enhance the teaching and learning process.



4 CHAPTER: QUANTITATIVE RESULTS AND DISCUSSION



“The only source of knowledge is experience.” Albert Einstein

4.1 INTRODUCTION

This chapter represents the results of the explorative quantitative investigation and analysis of data collected from students and lecturers and clinical facilitators in order to obtain information on instructional design and training contexts. This chapter addresses Objective 1, which was

to explore the knowledge of students and lecturers and clinical facilitators about the affordances of mobile devices for teaching and learning.

The literature review provided a background on the affordances of and the pedagogical and instructional models for mobile technology in an educational environment. Departing from a literature review surveys (an electronic instrument) were developed in Google Forms, a component of Google Drive was conducted with students, lecturers and clinical facilitators (Figure 4.1). The survey explored the knowledge of respondents about the affordances of mobile devices. This information was used to inform the development of an intervention plan to enhance the integration of the theory and clinical practice of the ENT health assessment in the primary care and clinical skills module (PCCSM).

The exploration of new technologies to enhance teaching and learning should from the onset consult students about their choice of an appropriate technology (Ivala & Gachago, 2012). It was important to establish the extent of participants’ knowledge about mobile devices and their perceptions on the affordances of mobile devices for teaching and learning as this would be the first m-learning intervention at a school of nursing at a HEI.

The student survey comprised 24 questions, while the lecturers and clinical facilitators’ survey contained 28 questions. In both surveys, Sections A and B contained exactly the same questions.

In Sections C and D, the questions were tailored for (i) students and (ii) lecturers and clinical facilitators specifically. The data was statistically analysed by an independent HEI statistician. The IBM Statistical Package for the Social Sciences (SPSS), Version 22, was used for data analysis.

The response rate to the electronic survey was good. A total number of 84 student participants (n=84; 100.0%) answered the questionnaire. Six (n=6; 100.0%) lecturers and clinical facilitators participated in the survey. This response rate (100.0%) is enough to allay fears of non-response bias (Saunders, Lewis & Thornhill, 2012).

Some of the questions in the survey required a simple “yes” or “no” response, while others required respondents to indicate the extent to which they disagreed or agreed with a given statement on a five-point Likert scale (never=1; hardly ever=2; sometimes do=3; frequently=4; always=5). Likert or summated rating scales are self-reported data collection instruments through which participants numerically respond to an expressed question based on their perceptions (De Vos *et al.*, 2011). Some closed-ended questions were included in the instrument.

The results of the quantitative data (descriptive) will be discussed under the following sections (with accompanying summaries, tables and graphs):

- Biographical information (Section A)
- Being mobile (“Mobileness”/Mobile literacy) (Section B)
- Internet connectivity (Section C)
- Communication (Section D)

The results will outline the:

- number of responses (n) on each item;
- mean value (\bar{x}) of each item; and
- standard deviation (SD) of each item.

4.2 FINDINGS

The research instrument for students (Table 4.1) consisted of 24 items and the total sample of 84 students responded to each of the items in their survey. The mean value for the responses of

students on items ranged from 1.07 to 10.56, while the SD ranged from 0.258 to 5.889. On the student instrument, the responses to the following items were not answered in a Likert scale format: questions one to nine, 12–14, 20 and 21. These questions were answered with either “yes” or “no” questions, or “select the most appropriate box or option” or an open-ended question.

The research instrument for lecturers and clinical facilitators consisted of 28 items (Table 4.2) and the total sample of six lecturers and clinical facilitators responded to each of the items in their survey. The mean value for the responses of lecturers and clinical facilitators on items ranged from 1.33 to 3.83, while the SD ranged from 0.516 to 3.445. On the lecturers and clinical facilitators’ instrument the responses to the following items were not answered in a Likert scale format: questions one to nine, 13– 15, 20 and 21. These questions were answered with either “yes” or “no” questions, or “select the most appropriate box or option”, or an open-ended question.

All the students and lecturers and clinical facilitators who participated in the survey answered all the questions.



Table 4.1: Descriptive statistics on Likert Scale: Students

No	Item	Never		Hardly ever		Sometimes do		Frequently		Always		Total		\bar{x}	SD
		1		2		3		4		5					
		n	%	n	%	n	%	n	%	n	%	n	%		
10	I will be able to use my mobile device to access library databases off-campus, e.g. EBSCO, ERIC, PubMed, etc. in order to do my own research on the examination of the head and neck within the PCCSM.	23	27.4	8	9.5	31	36.9	8	9.5	14	16.7	84	100.0	2.84	1.511
11	I will be prepared to use my mobile device, e.g. smartphone, notebook, laptop, etc. to help with the integration of theory and practice in the course of the examination of the head and neck within the PCCSM off-campus.	11	13.1	12	14.3	24	28.6	19	22.6	18	21.4	84	100.0	3.37	1.291
15	In the following questions, indicate, on a scale of 1 – 5, your degree of preference for each method of communication with your lecturer and clinical facilitator. Offline chats (e.g. SMS)	19	22.6	7	8.3	24	28.6	17	20.2	17	20.2	84	100.0	3.21	1.440
16	In the following questions, indicate, on a scale of 1 – 5, your degree of preference for each method of communication with your lecturer and clinical facilitator. Online chats (e.g. Mixit, WhatsApp Messenger, Skype)	17	20.2	6	7.1	14	16.7	24	28.6	23	27.4	84	100.0	3.51	1.502
17	In the following questions, indicate, on a scale of 1 – 5, your degree of preference for each method of communication with your lecturer and clinical facilitator. Email	3	3.6	4	4.8	9	10.7	21	25.0	47	56	84	100.0	4.21	1.146
18	In the following questions, indicate, on a scale of 1 – 5, your degree of preference for each method of communication with your lecturer and clinical facilitator. Online network community (e.g. Facebook)	14	16.7	17	20.2	15	17.9	18	21.4	20	23.8	84	100.0	3.28	1.469
19	In the following questions, indicate, on a scale of 1 – 5, your degree of preference for each method of communication with your lecturer and clinical facilitator. Blogging	55	65.5	9	10.7	13	15.5	4	4.8	3	3.6	84	100.0	1.77	1.151

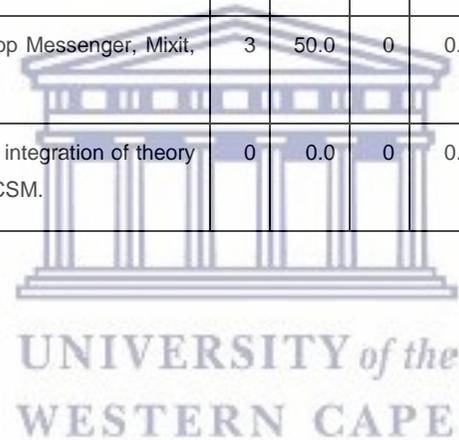
22	I am able to access content from the Internet that is relevant to the course content by means of my mobile device.	5	6.0	5	6.0	24	28.6	27	32.1	23	27.4	84	100.0	3.91	.921
23	I currently use my mobile device to chat with my lecturers and clinical facilitators via WhatsApp Messenger, Mixit, Facebook, etc. for academic support.	44	52.4	11	13.1	13	15.5	13	15.5	3	3.6	84	100.0	2.35	1.307
24	I am willing to engage with mobile devices to help me with the integration of theory and practice of the examination of the head and neck within the PCCSM.	2	2.4	6	7.1	14	16.7	23	27.4	39	46.4	84	100.0	4.23	.972

Table 4.2: Descriptive statistics: Lecturers and clinical facilitators

No	Item	Never		Hardly ever		Sometimes do		Frequently		Always		Total		\bar{x}	SD
		1		2		3		4		5					
		n	%	n	%	n	%	n	%	n	%	n	%		
10	I use my mobile device, e.g. smartphone, notebook, laptop, etc. to help students with the integration of theory and practice of the ENT health assessment in the PCCSM off-campus.	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2.83	1.602
11	I am able to use my mobile device to access library databases off-campus, e.g. EBSCO, ERIC, PubMed, etc. in order to do my own research on the ENT health assessment in the PCCSM.	3	50.0	0	0.0	1	16.7	1	16.7	1	16.7	6	100.0	2.50	1.761
12	Are you prepared to use your mobile device, e.g. smartphone, notebook, laptop, etc. to help students with the integration of theory and practice of the ENT health assessment of the PCCSM off-campus?	0	0.0	0	0.0	2	33.3	3	50.0	1	16.7	6	100.0	3.83	.753

16	In the following questions, indicate, on a scale of 1 – 5, your degree of preference for each method of communication with your students. Offline chats (e.g. SMS)	1	16.7	0	0.0	2	33.3	0	0.0	3	50.0	6	100.0	3.67	1.633
17	In the following questions, indicate, on a scale of 1 – 5, your degree of preference for each method of communication with your students. Online chats (e.g. Mixit, WhatsApp Messenger, Skype)	2	33.3	0	0.0	0	0.0	1	16.7	3	50.0	6	100.0	3.50	1.975
18	In the following questions, indicate, on a scale of 1 – 5, your degree of preference for each method of communication with your students. Email	1	16.7	0	0.0	1	16.7	1	16.7	3	50.0	6	100.0	3.83	1.602
19	In the following questions, indicate, on a scale of 1 – 5, your degree of preference for each method of communication with your students. Online network community (e.g. Facebook)	3	50.0	0	0.0	0	0.0	2	33.3	1	16.7	6	100.0	2.67	1.862
20	In the following questions, indicate, on a scale of 1 – 5, your degree of preference for each method of communication with your students. Blogging	3	50.0	1	16.7	1	16.7	1	16.7	0	0.0	6	100.0	2.00	1.265
21	If it has been omitted in this section, indicate your preferred method of electronic communication with your students in the box below (open-ended question).	1	16.7	3	50.0	1	16.7	1	16.7	1	16.7	6	100.0	1.50	.837
23	I am able to find and distribute relevant course content from the Internet to students by means of my mobile device.	1	16.7	1	16.7	1	16.7	2	33.3	1	16.7	6	100.0	3.17	1.472

24	I am able to use my mobile device to develop my own content in an online learning environment for students' use.	1	16.7	1	16.7	1	16.7	1	16.7	2	33.3	6	100.0	3.33	1.633
25	I currently use my mobile device in my teaching to send course information to students, e.g. changes in classes, assignment deadlines, etc.	1	16.7	1	16.7	1	16.7	1	16.7	2	33.3	6	100.0	3.33	1.633
26	I currently use my mobile device to review course-related pictures and videos made by students.	1	16.7	2	33.3	1	16.7	1	16.7	1	16.7	6	100.0	2.83	1.472
27	I currently use my mobile device to chat with students via WhatsApp Messenger, Mixit, Facebook, etc. to offer them academic support.	3	50.0	0	0.0	0	0.0	1	16.7	2	33.3	6	100.0	2.83	2.041
28	I am willing to engage with mobile devices to help students with the integration of theory and clinical practice (ITCP) of the ENT health assessment in the PCCSM.	0	0.0	0	0.0	1	16.7	2	33.3	3	50.0	6	100.0	4.33	.816



4.2.1 Section A: Biographical information

Gender of participants (Students Item 1; Lecturer and clinical facilitator Item 1)

According to Williams (2017), the Healthcare Professionals Network in the United Kingdom identified that even though efforts were made to promote gender equality in the workplace, the number of men in the nursing profession remained persistently low. The Nursing and Midwifery Council indicate that only 11.4% of registered nurses in the United Kingdom were male in 2016 (a minimal increase from five years earlier when male nurses made up 11.0% of the workforce) (Williams, 2017).

The results of the demographic characteristics of the study illustrated that 66 (78.6%) of the 84 (100.0%) participants registered for the third-year undergraduate PCCSM were females, while 18 (21.4%) were males (Figure 4.1) ($\bar{x} = 1.79$; $SD=0.412$). The nursing profession has historically been dominated by females, hence more female than male students participated in the study.

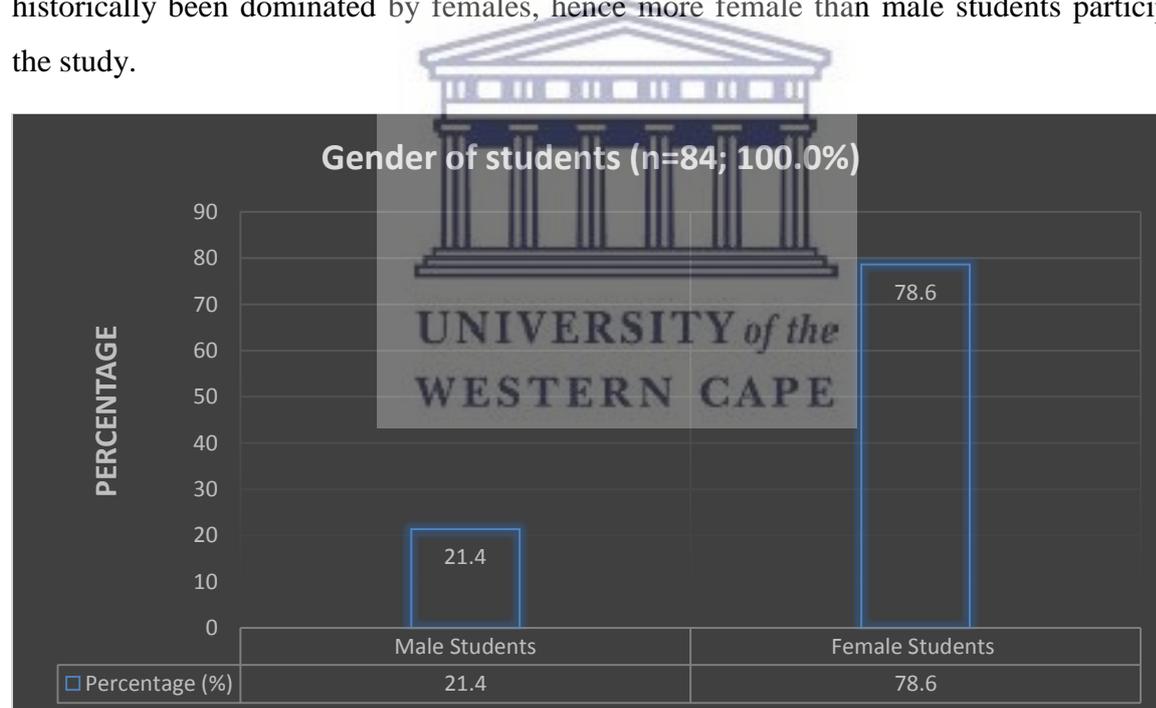


Figure 4.1: Gender of student participants

Four (66.6%) of the lecturers and clinical facilitators (n=6; 100.0%) of the PCCSM four (66.6%) who completed the survey were female, while two (33.3%) were male ($\bar{x} = 1.33$; $SD=0.516$) (Figure 4.2).

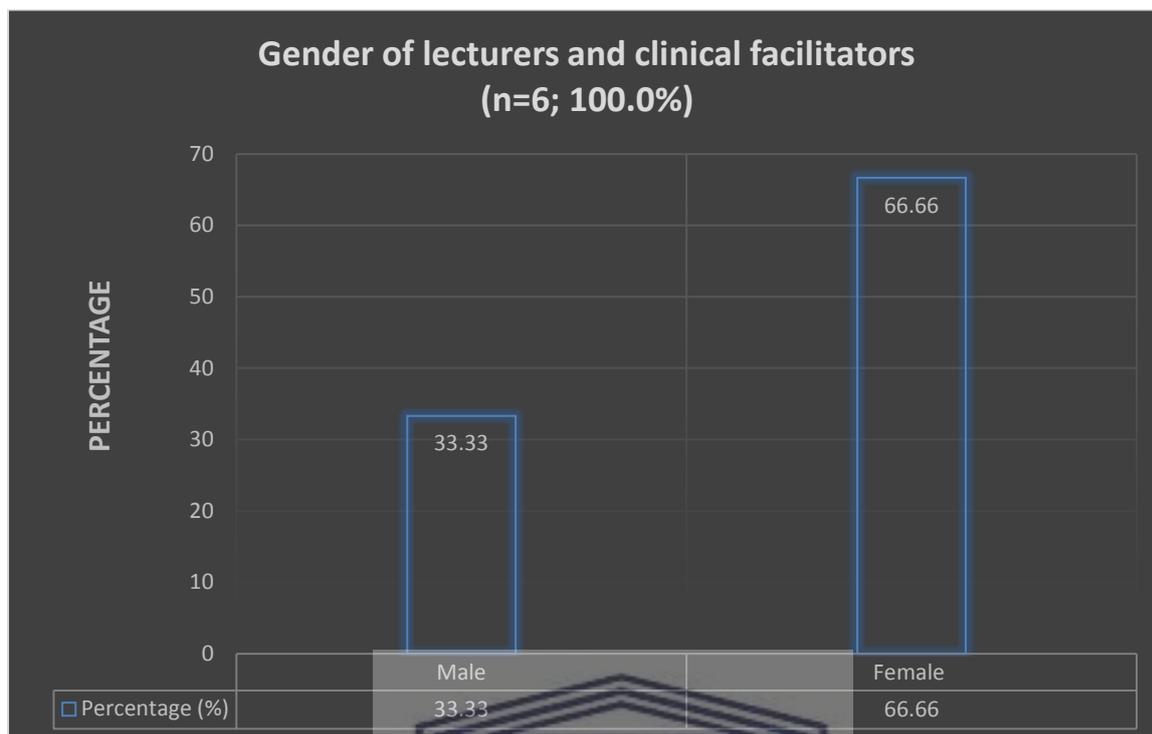


Figure 4.2: Gender of lecturers and clinical facilitators

There was a clear distinction between the ages of the students and that of the lecturers and clinical facilitators who participated in the study in the categories 26–30 years, 31–35 years and 36–40 years (Figure 4.3).

Age distribution of participants (Students Item 2; Lecturers and clinical facilitators Item 2)

Auerbach, Staiger, Muench and Buerhaus (2013) identify an increase in the number of individuals in their 30s entering a nursing degree programme, and more recently, an increase in the number of people in their 20s entering the nursing baccalaureate degree programmes. This phenomenon could be the reason why there is some similarity between the ages of the student group and the lecturers and clinical facilitator group.

The majority of student participants was between the ages of 21 and 25 years (n=48; 57.1%) (\bar{x} =1.93; SD=0.828). A third of the six lecturers and clinical facilitators (n=2; 33.3%) indicated their age between 26 to 30 years, with a wide distribution of responses around the mean value

(\bar{x} =0.533; SD=2.338). This could be interpreted as a relatively young age for a teaching position at an HEI. One participant in the lecturer and clinical facilitator group and eight student participants were in the same age category of 31 to 35 years (Figure 4.3).

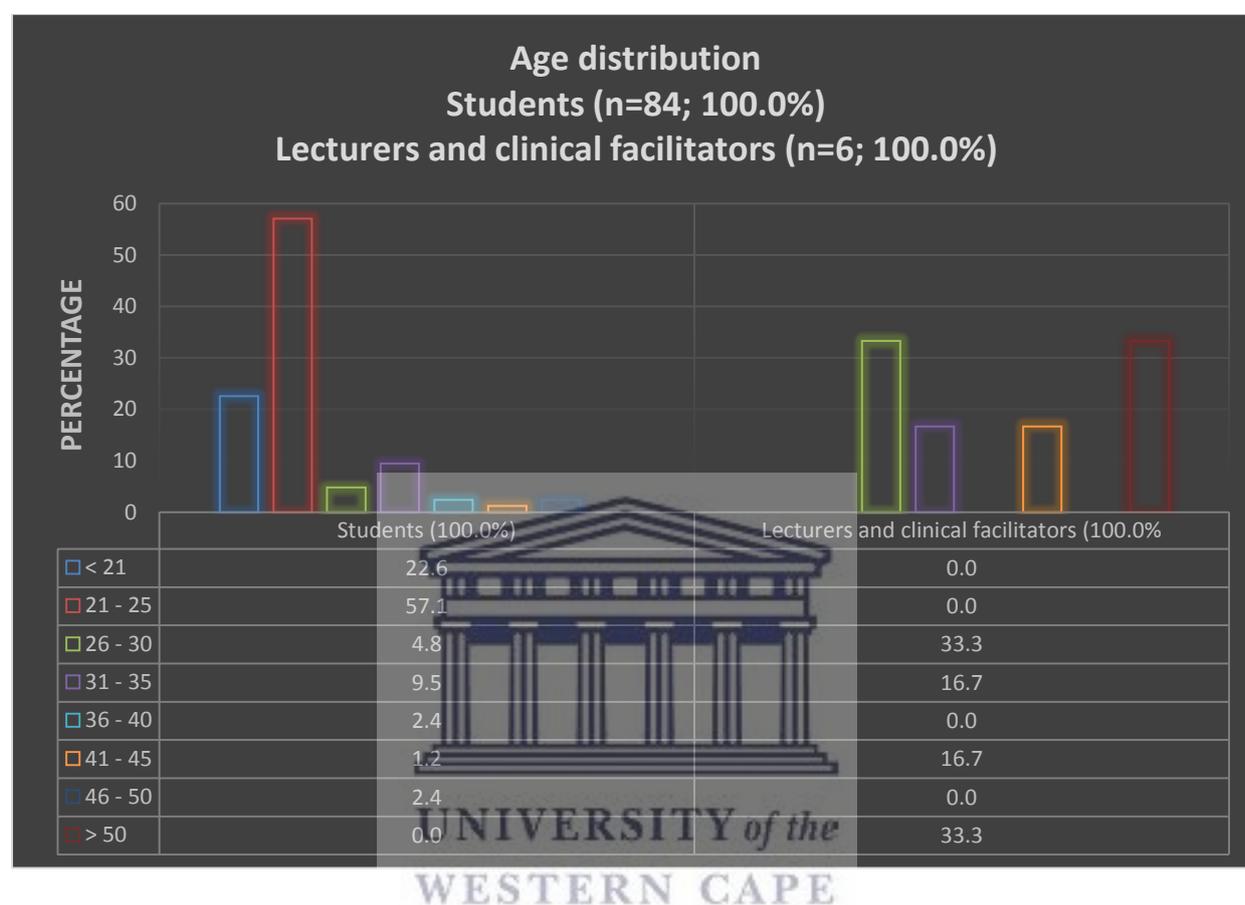


Figure 4.3: Age distribution of participants

Historically within the apartheid era students went to university once they have matriculated (at around 19 years of age), but the majority of the student participants were between 21–25 years of age. It could be interpreted that they may have done “something” after they matriculated as the expected age for a first-year student is 19 years as South African scholars generally matriculate at this age. The commander in chief of the Economic Freedom Fighters, Mr. Julius Malema, called on all previously disadvantaged individuals with a matric certificate (Grade 12) who wished to further their education to report to academic institutions of their choice at the start of the academic year in 2018. Mr. Julius Malema also indicated that: *"We must make sure that in 2018 all academically deserving students are admitted freely in SA universities and FET colleges"* (Spies, 2017).

It can be concluded that demographic characteristics identified in the biographical information indicated that nursing is still a female dominated profession and that there is an influx of “older” students into the baccalaureate degree programme.

4.2.2 Section B: Being mobile (“mobileness”/mobile literacy)

The use of and the mobility offered by mobile devices and social media platforms enable students to involve and draw on the expertise of others around the world. Students are afforded the opportunity to engage by establishing and maintaining associations to events not limited to time or space (Sharples *et al.*, 2016).

Duration of mobile device use: students (Students Item 3)

It was important to determine when participants first started using a mobile device as this could indicate their proficiency in using their personal mobile device with its selected applications. Responses to when participants started to use mobile devices (n=84;100.0%) were as follows: 67 (79.8%) students indicated more than three years ago; ten students (11.9%) indicated two to three years ago; four (4.8%) students indicated one year ago; and three (3.6%) students indicated six months ago or less (Figure 4.4).

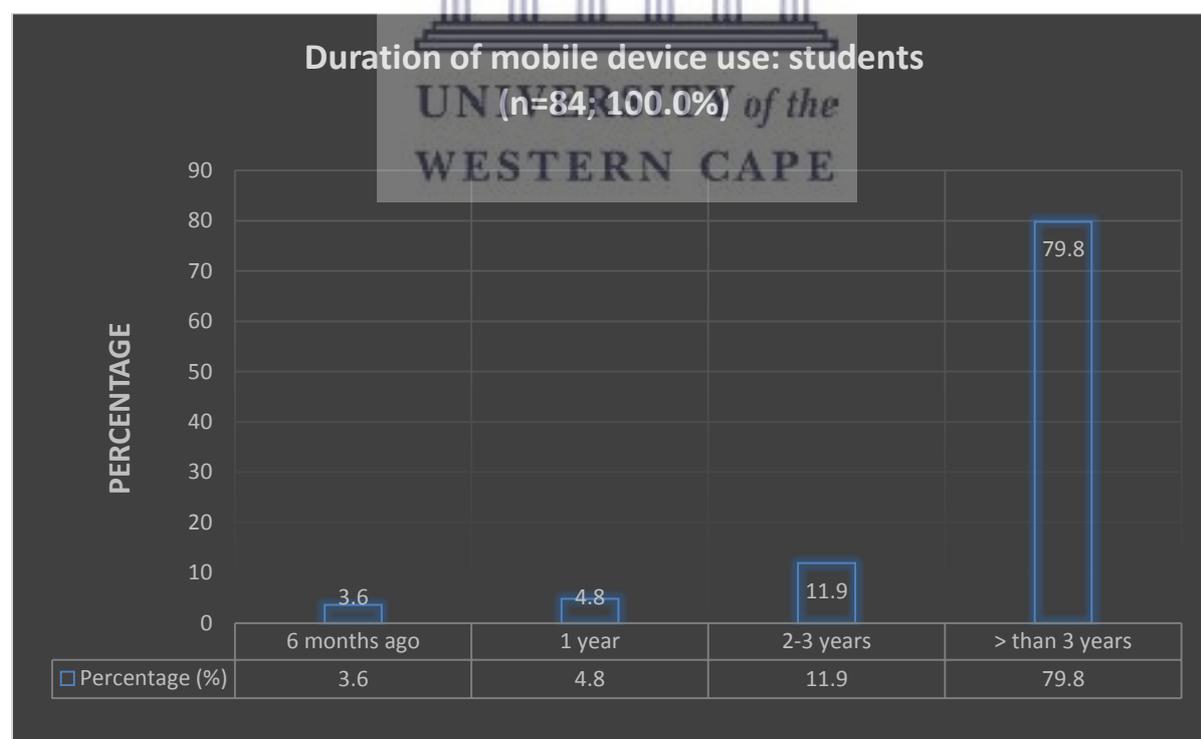


Figure 4.4: Duration of mobile device use: students

A study by Demouy and Kukulska-Hulme (2010) includes students who were participating in a mobile language learning project in an undergraduate distance learning French language programme at the Open University in the United Kingdom. Students identified the benefits of using their mobile device to maximise their exposure to the language in spaces and at times that suited their lifestyle (Demouy & Kukulska-Hulme, 2010).

In this study, the majority of students has been using their mobile devices for more than three years (\bar{x} =3.79; SD=0.600) (Figure 4.5). The assumption was that students would know how to effectively use their personal mobile devices and that they would thus not be disadvantaged during a m-learning intervention.

Students and lecturers and clinical facilitators who have been using mobile devices for more than three years could possibly be aware of the benefits of using their device to integrate the theory and clinical practice of a m-learning intervention.

The flexibility created by online learning created eliminated the need for learning to happen at a set time and place. Mobility in learning using mobile devices such as smartphones enables access to instructional content such as videos, podcasts and other multimedia formats. This provides individuals with flexibility in access to content on their mobile devices whenever and wherever they need to (Jenkins, 2016).

It could be concluded that the majority of students and lecturers and clinical facilitators have an understanding of how to use a mobile device as the majority have been using it for more than six months. Their understanding of the benefits of using their mobile device could allow maximised exposure in their learning opportunities in spaces and at times that suited their lifestyle.

Duration of mobile device use: Lecturers and clinical facilitators (Lecturers and clinical facilitators Item 3)

Conejar, Kim and Lee (2014) indicate that the changes brought about by emerging technologies had a definite influence on education in the 21st century. The future of education is thus being shaped by current technologies that changed how we experience teaching and learning (Conejar, Kim & Lee, 2016).

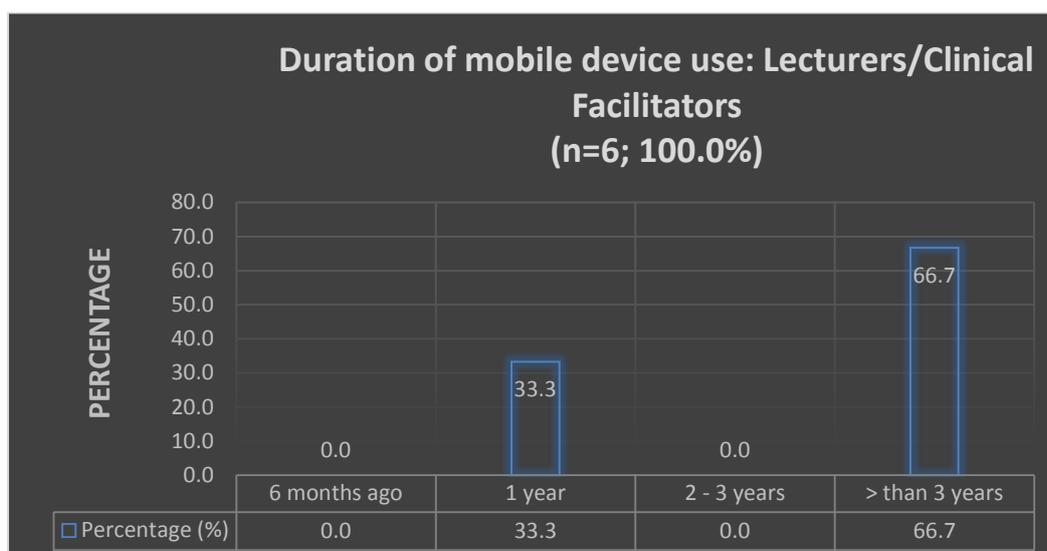


Figure 4.5: Duration of mobile device use: lecturers and clinical facilitators

With the emerging new technologies, uncertainty could exist when starting to use a m-learning tool for the first time. Four (66.7%) of the six (100.0%) lecturers and clinical facilitators indicated that they have been using a mobile device for more than three years, while two (33.3%) lecturers and clinical facilitators indicated that they only started using a mobile device about a year ago (Figure 4.5) ($\bar{x}=3.33$; $SD=1.1033$).

The use of applications for smartphones and tablets, including cloud solutions and concepts of BYOD, in teaching and learning opened numerous possibilities of multimedia collaboration and communication enabling new approaches to generate knowledge (de Witt & Gloerfeld, 2018).

How participants originally learned to use mobile devices (Students Item 4; Lecturers and clinical facilitators Item 4)

The results of a study by the Educause Centre for Analysis and Research with undergraduate students in information technology provided extremely useful, evidence-based “trail markers” to assist in the exploration of the changing teaching and learning landscape.

One of the interesting key findings of the study was that most students were prepared to use technology when they entered the HEI. The deduction made is that current undergraduate students appear to be more prepared to use technology in HEIs (ECAR, 2015).

More than two-thirds, 65 (77.4%) of the 84 (100.0%) students, indicated that they became familiar with the functions of their mobile devices while using them, while 15 (17.9%) students

learned from friends, seven (8.3%) students learned from colleagues/peers on-campus, a few (n=8; 9.5%) students learned from family, while five (6.0%) students learned from a consultant of their mobile device provider ($\bar{x} = 1.88$; $SD=1.867$) (Figure 4.6).

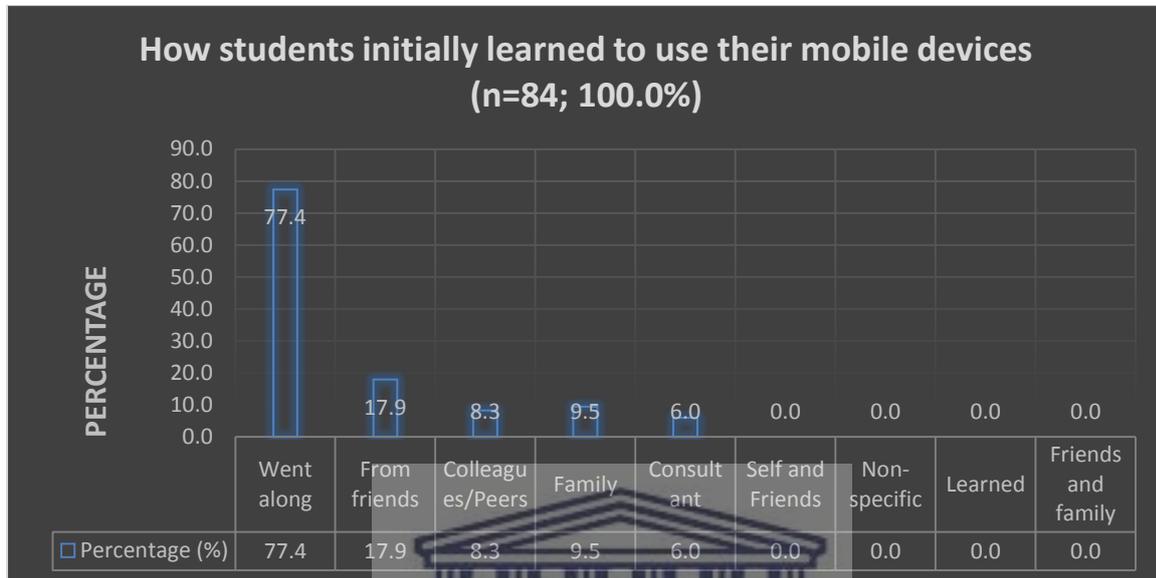


Figure 4.6: Initial way of learning to use mobile devices: students

Five (83.3%) of the six (100.0%) lecturers and clinical facilitators learned how to use their mobile devices on their own and one (16.7%) lecturer and clinical facilitator learned from colleagues/students on-campus ($\bar{x} = 1.50$; $SD=1.225$) (Figure 4.7).

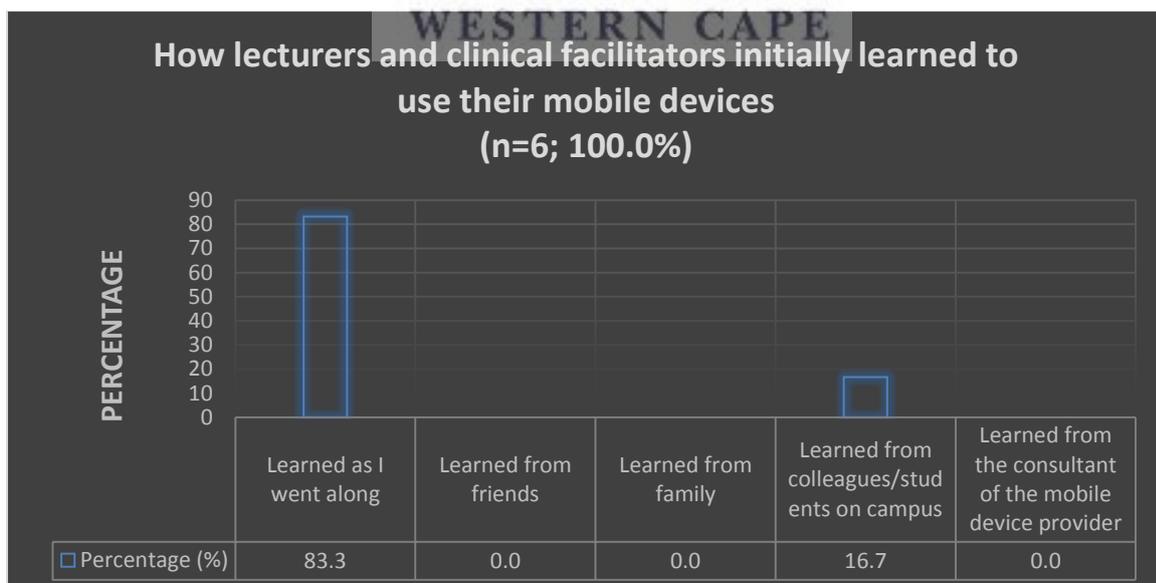


Figure 4.7: Initial way of learning to use mobile devices: lecturers and clinical facilitators

It was interesting that the majority of the students and lecturers and clinical facilitators became familiar with the functions of a mobile device while using it. Dahlstrom, Brooks, Grajek and Reeves (2015) confirmed in their study that two-thirds of students were prepared to use technology when they entered the HEI.

It could be concluded that students and lecturers and clinical facilitators would be willing to use mobile technology in HEIs as they generally became familiar with the functions of a mobile device while using it.

Where or from whom do participant seek help when experiencing problems with their mobile devices (Students Item 5; Lecturers and clinical facilitators Item 5)

Hoar (2014) specifies that the lack of technological competency is becoming a major barrier to teaching and learning in higher education. Nearly half (n=36; 42.9%) of the students indicated that they asked friends to help them when they had any problems with their mobile devices. Less than a third (n=24; 28.6%) of the 84 (100.0%) students solved the problem on their own, while 18 (21.4%) asked a consultant of the mobile device provider. Only 12 (14.2%) students asked colleagues or students' on-campus, ten (11.9%) students asked family, nine (10.7%) students referred to the manual of the mobile device and eight (9.5%) students searched for guidance online. Some students selected more than one option when asked whom they sought help from when they had any problems with their mobile devices ($\bar{x}=0.656$; $SD=0.5288$) (Figure 4.8).

The lecturers and clinical facilitators' (n=6; 100.0%) indication of whom they sought help from when they had any problems with their mobile devices were as follows: two (33.3%) lecturers and clinical facilitators indicated that they asked family; one (16.7%) indicated solving the problem on his/her own; one (16.7%) indicated that he/she asked for help from friends; one (16.7%) indicated that he/she asked colleagues/students on-campus; and one (16.7%) indicated he/she asked a consultant of the mobile service provider ($\bar{x}=3.17$; $SD=1.722$) (Figure 4.8).

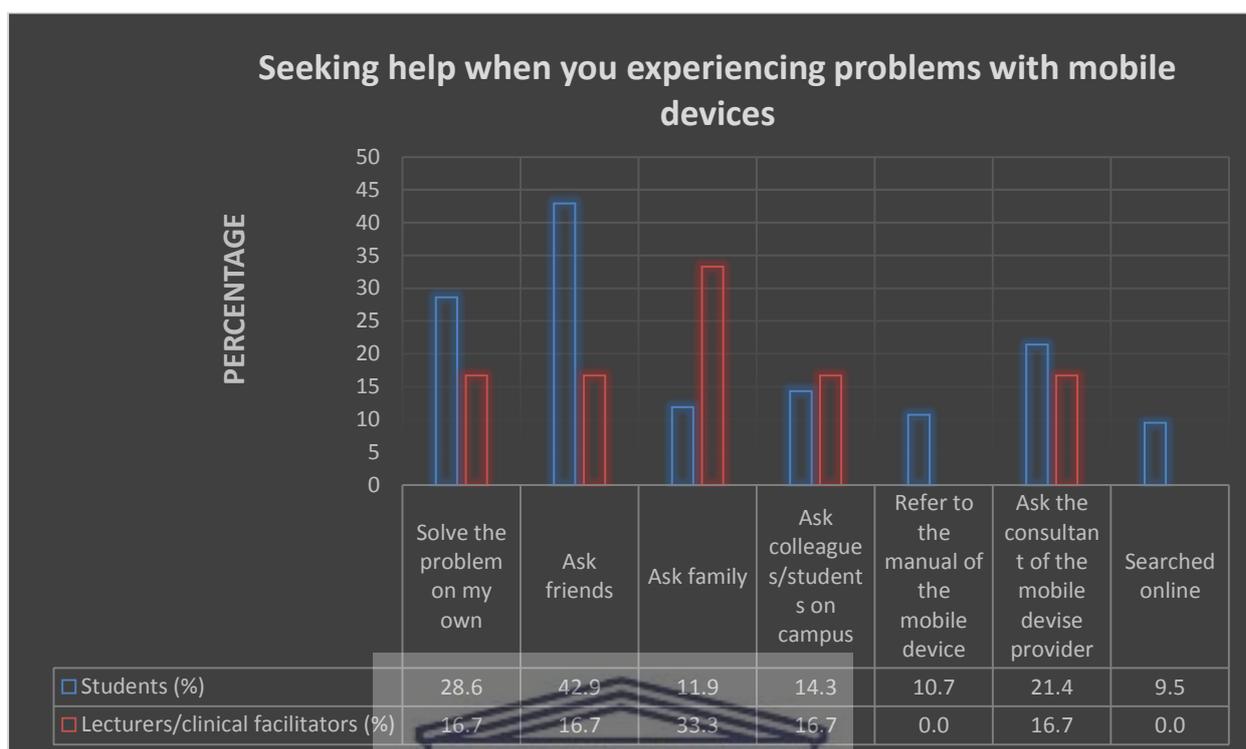


Figure 4.8: Seeking help when experiencing problems with mobile devices

Figure 4.8 indicates where students and lecturers and clinical facilitators sought help from when they experienced problems with their mobile devices. It was interesting to see that nearly half ($n=36$; 42.9%) of students asked their friends for help while experiencing problems with their mobile devices, while two ($n=2$; 33.3%) of lecturers and clinical facilitators asked their family for help.

Computer literacy, currently referred to as digital literacy, enables people to perform tasks in a digital medium, e.g. gathering information, communicating across platforms, critically analysing digital information and creating digital artefacts (Bayrak & Yurdugül, 2013; Bulger, Mayer & Metzger, 2014). Providing technical support to students, lecturers and clinical facilitators would be of importance as they would have access to patient information on their mobile devices and confidentiality of patient information would have to be ensured. Technological knowledge and available resources are important for participation in an educational technology program (Sung *et al.*, 2016).

It could be concluded that students and lecturers and clinical facilitators would seek the help of a consultant when experiencing problems with their mobile devices.

Type of mobile device(s) used at the time of the survey (Students Item 6; Lecturers and clinical facilitators Item 6)

Several brands of mobile devices can be used in teaching and learning. The portability of a wide range of mobile devices, combined with wireless communication, enhances the integration of learning and instruction in both traditional classroom settings and outdoor informal learning (Sung *et al.*, 2016).

More than half (n=48; 57.1%) of the 84 students (100.0%) used a smartphone and 43 (51.2%) students used a laptop. Nearly a third (n=25; 29.8%) of the students used a basic mobile phone (voice, SMS), with limited or no Internet access. Fewer student participants used other devices as only two (2.4%) students used an e-reader, three (3.6%) students used a full-size tablet and one (1.2%) student used a non-phone device (\bar{x} =5.33; SD=3.530) (Figure 4.9).

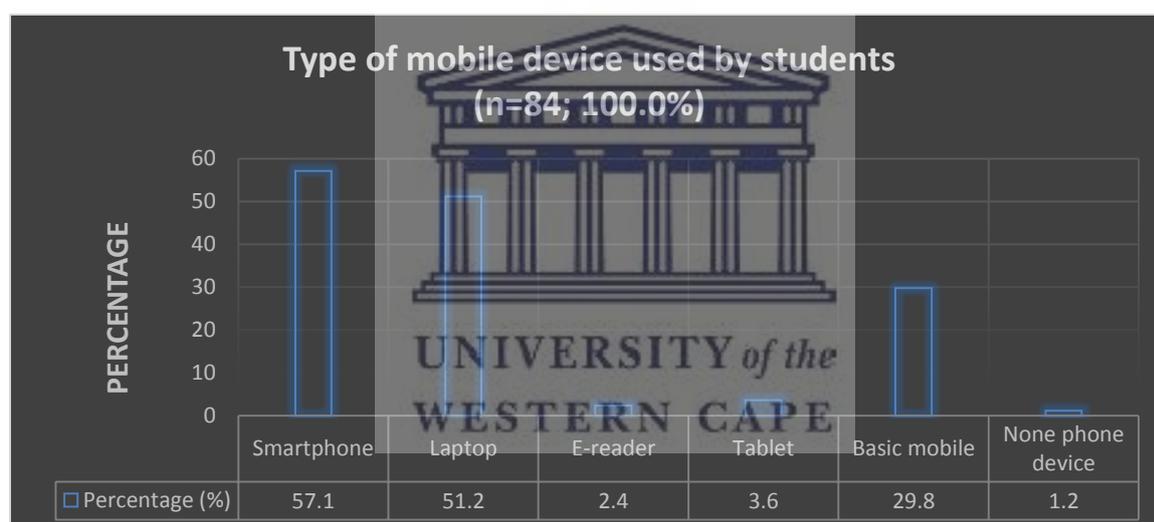


Figure 4.9: Type of mobile devices used by students

At the time of the survey, more than two-thirds (n=4; 66.7%) of lecturers and clinical facilitators were using smartphones, three (50.0%) were using laptops, two (33.3%) were using basic phones and one (16.7%) lecturer or clinical facilitator was using a tablet (\bar{x} =1.67; SD=0.516) (Figure 4.10).

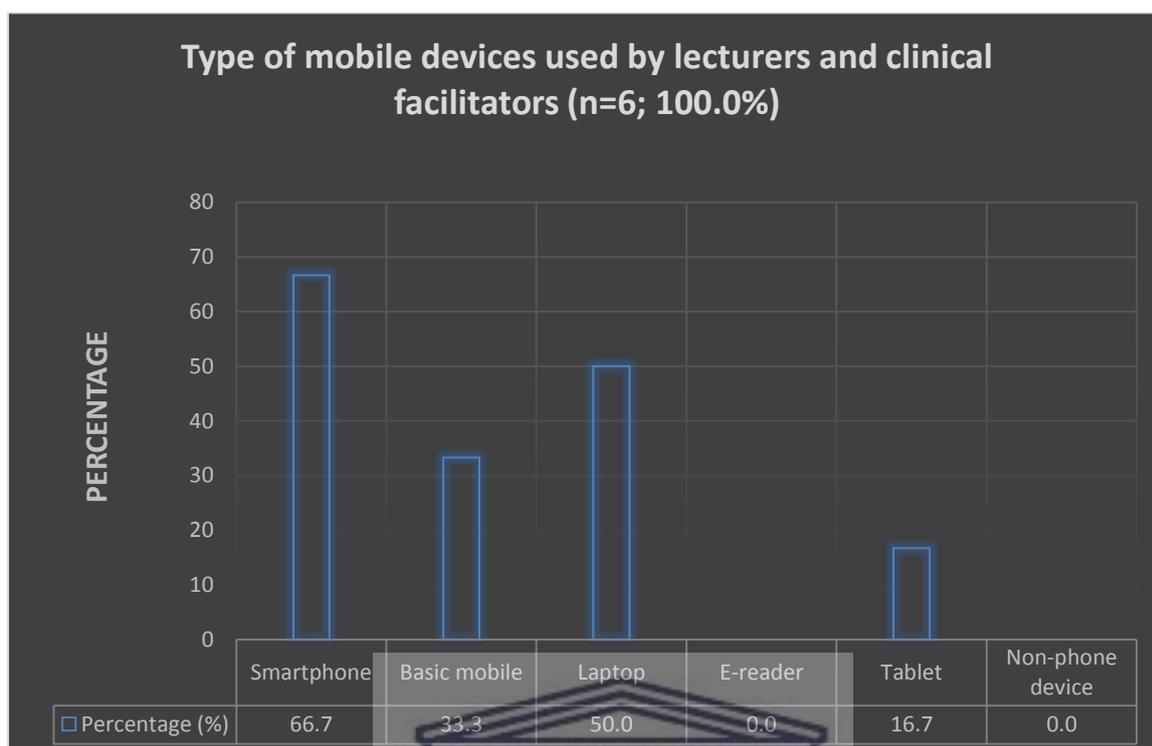


Figure 4.10: Type of mobile devices used by lecturers and clinical facilitators

Sung, Chang and Liu (2016) describe that over the past 20 years, mobile computers such as laptops, personal digital assistants, tablets, PCs, cell phones, and e-book readers have been gradually introduced into the educational contexts.

The majority of students (n=48; 57.1%) and lecturers and clinical facilitators (n=4; 66.7%) were using smartphones that could be used in a m-learning intervention within an educational context.

Students in an open-ended question (Item 21) mentioned that their mobile devices afforded them accessibility. The mobile devices were “easier, more accessible, faster and time-saving” (n=84; 100.0%). Distinctive features of mobile devices that could enhance the learning opportunities of students include individualised interfaces, real-time access to information, context sensitivity, instant communication and feedback (Sung *et al.*, 2016).

It could be concluded that a preparatory workshop to review the suitability of the mobile devices of participants is needed prior to a m-learning intervention.

Time period during which mobile devices are used by participants (Students Item 7; Lecturers and clinical facilitators Item 7)

On the consistent use of their smartphones, nearly two-thirds (63.1%) of the 84 (100.0%) students indicated that they used their mobile device at any available time, and less than a quarter of the students (n=20; 23.8%) indicated that they used their mobile device daily after 16:00. A few students, namely 15 (17.8 %), selected an option from the seven remaining options that indicated that they used their devices either over weekends only or between 06:00–10:00 or between 10:00–12:00, etc. (\bar{x} =1.84; SD=1.772).

There was an indication that half (n=3; 50.0%) of the lecturers and clinical facilitators used their mobile devices at any available time during the day while two (33.3%) used their mobile devices mainly between 12:00–14:00. One (16.7%) lecturer or clinical facilitator used the device only after 16:00 (\bar{x} =0.63; SD=1.966). The standard deviation showed a wide distribution of responses around the mean value.

To be successful, students would need to have access to their mobile devices at any time during their clinical placement to either clarify challenges with lecturers and clinical facilitators, or to conduct web-based research. Clayton and Murphy (2016) acknowledge that a substantial percentage of students surveyed in a study on smartphone applications in education used their smartphones for Internet access consistently throughout the day and on a daily basis.

It could be concluded that the best time for a m-learning intervention would be at any available time throughout the day, as indicated by the majority of students, lecturers and clinical facilitators.

4.2.3 Section C: Internet connectivity

This section explores the ability of students, lecturers and clinical facilitators to connect to the Internet when off-campus. According to Mullen and Wedwick (2008), “Being literate no longer only involves being able to read and write. The literate of the twenty-first century must be able to download, upload, rip, burn, chat, save, blog, Skype, IM, and share”. There has been a rapid increase in the use of social media networks in higher education with the majority of users being young adults viewed as the “digital native”. Universities had to adapt to this trend to support the

academic activity of these “digital natives”, whether in an official or unofficial capacity (Falahah & Rosamala, 2012).

Being able to connect to the Internet off-campus (Students Item 8; Lecturers and clinical facilitators Item 8)

Research studies identify important challenges related to Internet access when using mobile devices in teaching and learning, including network/bandwidth failures and a lack of Internet enabled/smart mobile devices among both students and lecturers (Kaliisa & Picard, 2017; Witt, Kebaetse, Holmes, Littman-Quinn, Ketshogileng, Antwi, Kovarik & Nkomazana, 2016).

Two-thirds, 66 (78.6%) of 84 (100.0%) students, indicated that they were able to connect to the Internet while off-campus, while 18 (21.4%) students with a narrow response around the mean value ($\bar{x} = 1.16$; $SD = 0.374$) indicated that they were not able to connect to the Internet off-campus. This information emphasises the importance of access to Internet connectivity for the success of this proposed m-learning intervention and raises a concern for further exploration. Every lecturer and clinical facilitator ($n = 6$; 100.0%) indicated that they were able to connect to the Internet off-campus. The mean value (\bar{x}) and standard deviation (SD) indicated a constant probability value of 1).

Smartphones have brought computing power into the palm of students' hands, resulting in Internet connectivity almost anywhere and anytime in South Africa (Liebenberg, Chetty & Prinsloo, 2012). Barnwell (2016) refers to a smartphone as a “mini-supercomputer” with the potential of the device to impact teaching and learning.

It could be concluded that the majority of students and all lecturers and clinical facilitators would be able to connect to the Internet when off-campus.

Type of Internet connection used most often (Students Item 9; Lecturers and clinical facilitators Item 9)

Wireless devices, as individualised and collaborative communication tools, have the ability to extend learning beyond the classroom walls into areas such as hospitals, homes, airports, buses, taxis and trains where students may not have direct or immediate access to a computer (George *et al.*, 2010; Siemens & Tittenberg, 2009).

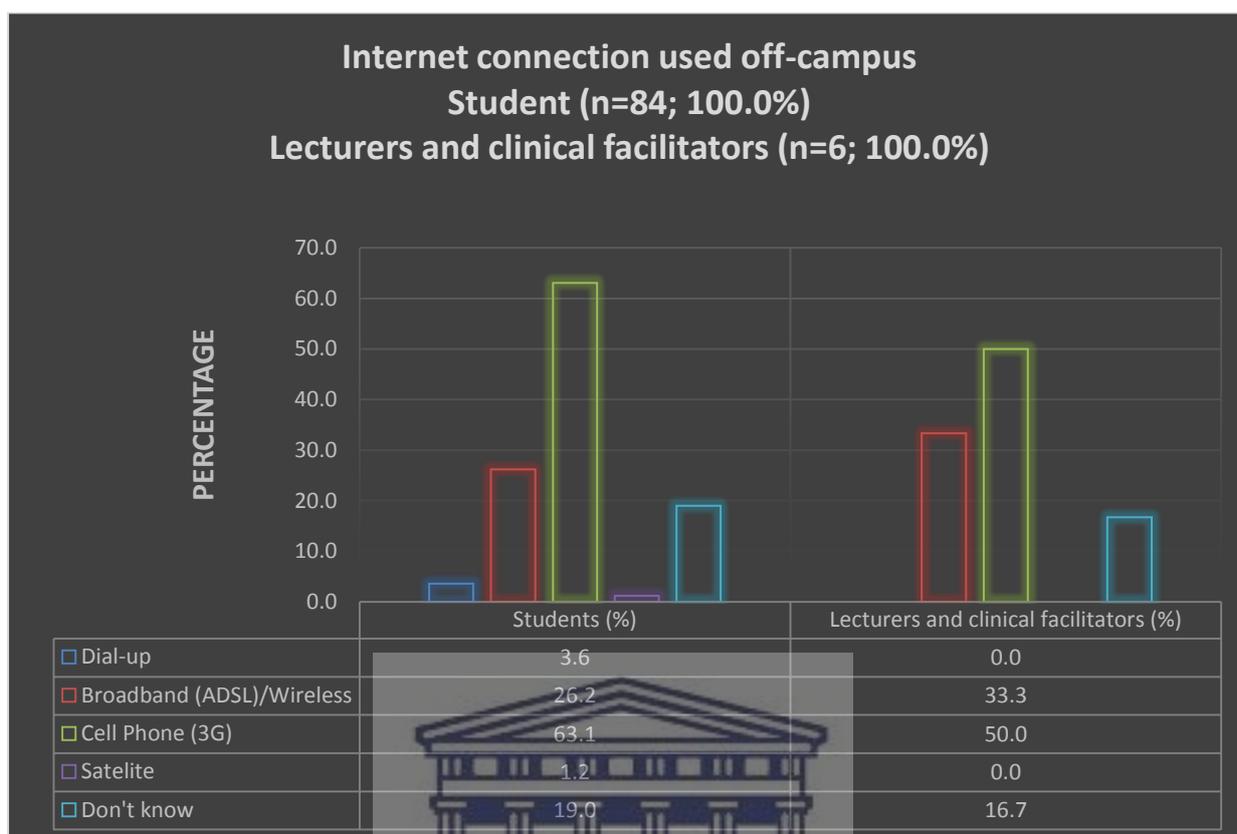


Figure 4.11: Internet connection used off-campus

The responses were widely distributed around the mean value ($\bar{x} = 3.05$; $SD = 2.329$) as the most common off-campus (where applicable) form of Internet connection for students were cell phones (3G) ($n = 53$; 63.1%); followed by broadband (ADSL/Wireless) ($n = 22$; 26.1%); while 16 (19.0%) students indicated that they did not know which type of Internet connection they used; and three (3.6%) students indicated using dial-up Internet.

The lecturers and clinical facilitators indicated their Internet availability off-campus. Half ($n = 3$; 50.0%) of the lecturers and clinical facilitators used cell phones (3G), a third ($n = 2$; 33.3%) used broadband and one (16.7%) lecturer or clinical facilitator did not know what type of Internet connection was being used ($\bar{x} = 3.00$; $SD = 1.095$).

Figure 4.11 provides a summary of the off-campus Internet availability of students, lecturers and clinical facilitators.

The findings may pose to be a challenge for the implementation of a m-learning strategy, specifically for the proposed purposes of providing Internet pictures in facilities where students will be unable to take pictures of actual patients themselves.

There are technical issues that can impact m-learning perceptions, which include limited access to the Internet and challenges with wireless connectivity, including access to content through institutionalised firewalls (Bower, 2017).

The inclusion criteria of the study clearly specified that all participants must have access to the Internet to be included in the study as they would need to be able to connect off-campus to participate in activities communicated using WhatsApp Messenger.

It could be concluded that students, lecturers and clinical facilitators should be able to connect to the Internet when off-campus.

Access library databases off-campus using mobile devices (Students Item 10; Lecturers and clinical facilitators Item 11)

The results of a study involving undergraduate students at Istanbul University, Turkey, indicated that information technology and the Internet play a key role in the daily life of university students, but that most of the students do not use the Internet for course-related readings and research needs (Deniz & Geyik, 2015).

More than a quarter of students (n=23; 27.4%) pointed out that they would never be able to use their mobile devices to access library databases (e.g. CINAHL, Cochrane library, EBSCO, ERIC, JSTOR, PubMed, Sabinet, etc.) off-campus in order to do their own research on the ENT health assessment in the PCCSM.

On the other hand, a third (n=31; 36.9%) of students indicated that they sometimes would, and only 14 (16.7%) students indicated that they always did. Eight (9.5%) students indicated that they frequently accessed data bases off-campus, while the same number of students (eight) claimed to hardly ever access databases off-campus ($\bar{x}=2.84$; $SD=1.511$) (Figure 4.12).

The findings highlight the challenge in guiding students to use these platforms or search engines.

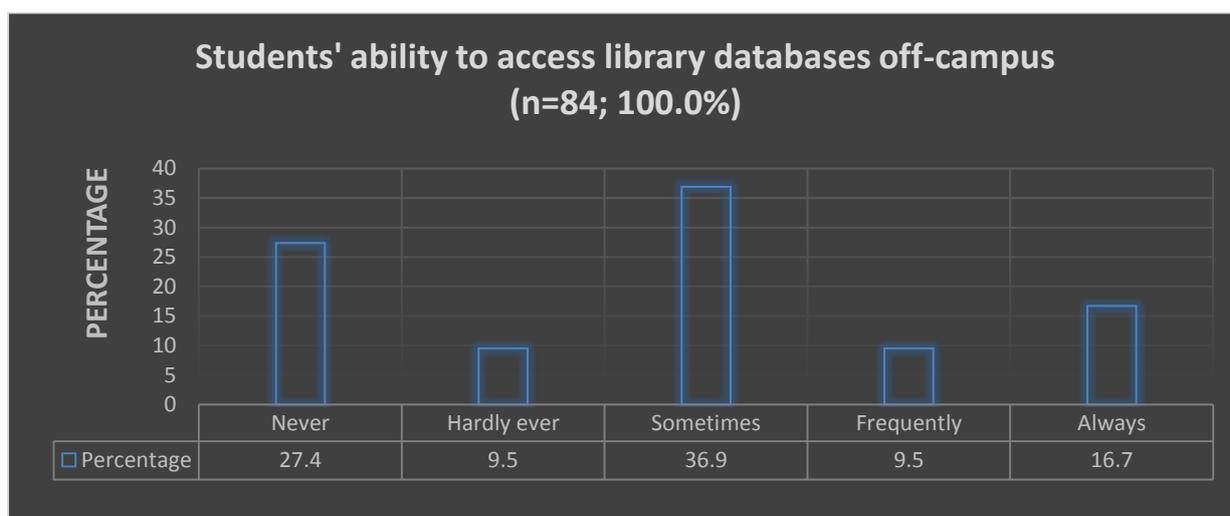


Figure 4.12: Module-related access to library databases: Students

Half (50.0%), therefore three, lecturers and clinical facilitators indicated that they were never able to access library databases (e.g. CINAHL, Cochrane library, EBSCO, ERIC, JSTOR, PubMed, Sabinet, etc.) off-campus in order to do their own research on the ENT health assessment in the PCCSM. On the other hand, one (16.7%) participant in the lecturer and clinical facilitator group indicated sometimes, one (16.7%) indicated frequently and one (16.7%) indicated that he/she could always access databases off-campus ($\bar{x} = 2.50$ $SD=1.761$) (Figure 4.13).

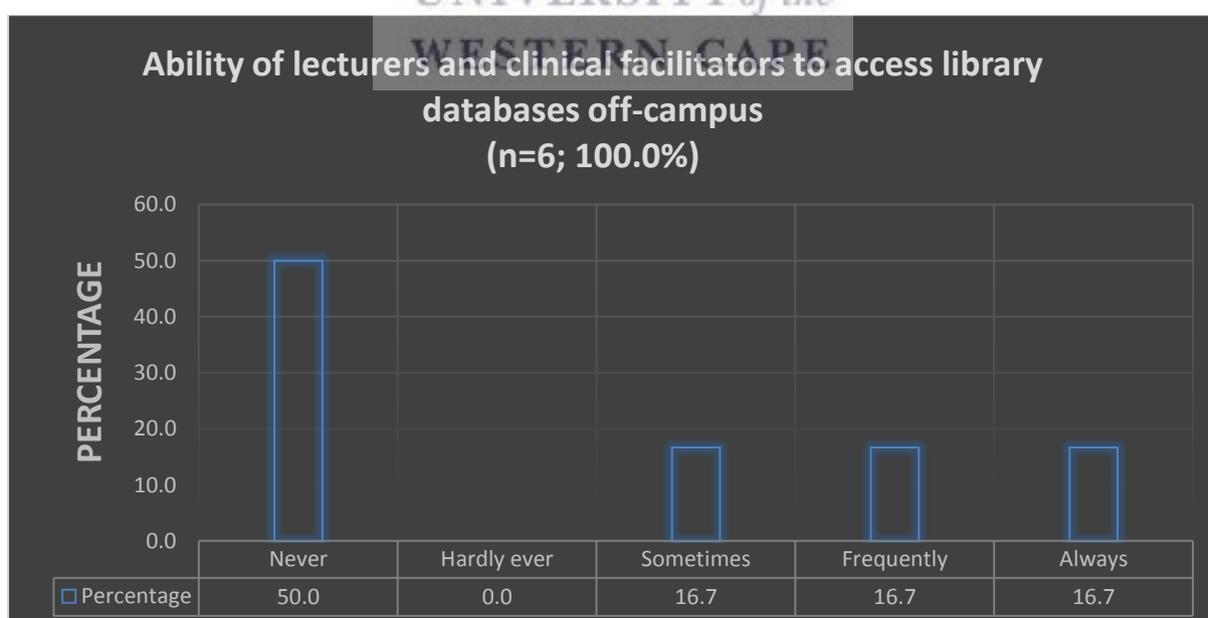


Figure 4.13: Module-related access to library databases: Lecturers and clinical facilitators

These responses emphasise the need to find a platform that lecturers and clinical facilitators can use to distribute academic resources to students. Lin (2017) explored the convergence of the mobile learning mode in network environment and the traditional classroom teaching and it was identified that learning resources had to be designed and available on mobile learning platforms before the intervention to enable students to complete the related courses (Lin, 2017).

It could be concluded that resources will have to be made available during a m-learning intervention due to challenges to access library search engines off-campus.

Preparedness to use their mobile devices off-campus (Students Item 11; Lecturers and clinical facilitators Item 12)

Wireless devices, as individualised and collaborative communication tools, have the ability to extend learning beyond the classroom walls into areas such as hospitals, homes, airports, buses, taxis and trains where students may not have direct or immediate access to a computer (George *et al.*, 2010; Siemens & Tittenberg, 2009).

Students and lecturers and clinical facilitators had to be informed of the advantages of being prepared to use their mobile devices off-campus to extend learning beyond the geographical boundaries of the university, clinical facilities and where they reside.

Participants were asked whether they would be prepared to use their mobile devices, e.g. smartphones, notebooks, laptops, etc. off-campus to help with the integration of the theory and clinical practice of the ENT health assessment in the PCCSM and they responded as follows: Nearly a quarter (n=24; 28.6%) of the students indicated that they would sometimes use it; 19 (22.6%) indicated that they would frequently use it; and 18 (21.4%) indicated that they would always use it.

Only a few (n=11; 13.1%) students pointed out that they would never be prepared to use their mobile devices, e.g. smartphones, notebooks, laptops, etc. to improve the integration of the theory and clinical practice of the ENT health assessment in the PCCSM off-campus; and 12 (14.3%) students would hardly ever do so ($\bar{x}=3.37$; $SD=1.291$) (Figure 4.14).

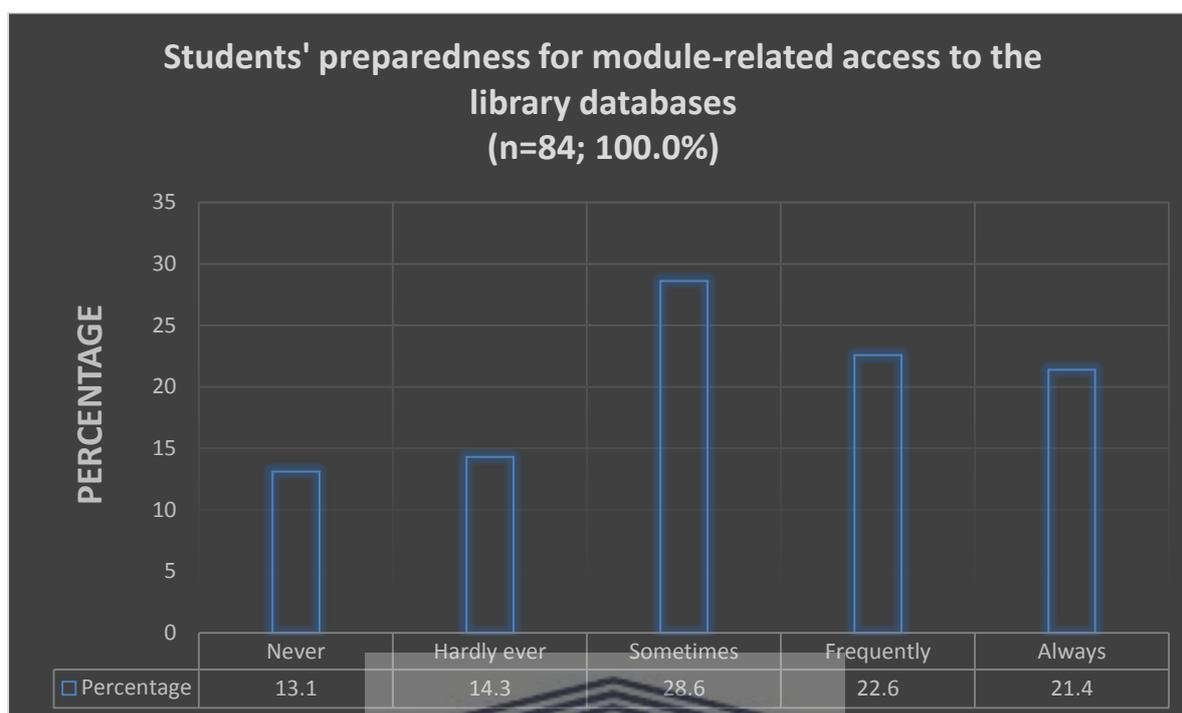


Figure 4.14: Preparedness to use their mobile devices off-campus (Item 12)

A challenge arose because 47 (56.0%) student participants indicated that they would never to sometimes be prepared to use their mobile devices off-campus to improve ITCP in the course of the ENT health assessment in the PCCSM.

This was concerning and further investigation into the reasons why some student participants were not prepared to use their personal mobile devices to improve ITCP s were needed. The use of devices has cost implications and the decision to use a device could depend on what kind of mobile device a student has and how convenient it is to use.

Two (33.3%) of the six lecturers and clinical facilitators indicated that they would never be willing to use their mobile devices e.g. smartphones, notebooks, laptops, etc. to assist students with ITCP in the context of the ENT health assessment in the PCCSM off-campus. Two (33.3%) indicated that they would sometimes, while one (16.7%) lecturer or clinical facilitator indicated that he/she frequently would; and one (16.7%) indicated that he/she always would (\bar{x} =3.83; SD=0.753). This means that over two-thirds of the lecturers and clinical facilitators were neither enthusiastic nor prepared to use their personal mobile devices consistently to communicate with the purpose of facilitating ITCP of the ENT health assessment in the PCCSM.

Abidin, Mathrani, Parsons and Suriadi (2016) viewed the opportunities and challenges of mobile learning in the promotion of mathematical literacy and concluded that technological skills was not enough to integrate technology into teaching and learning practices. Appropriate training for educators was recommended to assist in the improvement of their technology skills and in establishing of pedagogical knowledge with technology (Abidin, Mathrani, Parsons & Suriadi, 2016). Siddiq, Scherer, and Tondeur (2016) identified the importance of digital skills in 21st Century life as young students are very adept at using digital technology. Brown (2016) acknowledged that factors influencing university educators' ability to adopt and use technology integrated with face-to-face instruction are pedagogical beliefs, lack of technological ability, workload commitments, environment, relationships with students, and the availability of professional development.

It could be concluded that a positive attitude is needed regarding the use of personal mobile devices for a m-learning intervention.

Mobile applications being used (Students Item 12; Lecturers and clinical facilitators Item 13)

The potential for using WhatsApp Messenger as an instant messaging tool is particularly pertinent in resource-poor contexts (Yeboah & Ewur, 2014) such as a previously disadvantaged university setting. Owing to affordability and accessibility, instant messaging has great potential for use in higher education contexts for both formal and informal learning, particularly, as mentioned, in resource-poor contexts such as the HEI where this study was undertaken (Bere, 2012; Church & de Oliveira, 2013; Ng'ambi, Brown, Bozalek, Gachago & Wood, 2016).

The current use of mobile applications would be an important guide to establish which application would be most suitable for this research study. Student participants and lecturers and clinical facilitators were able to identify more than one application that they were using.

The results from students indicated that the two most popular mobile applications were WhatsApp Messenger and Facebook. The majority of the students, i.e. 66 (78.6%), used WhatsApp Messenger; three-quarters (n=63; 75.0%) used Facebook; a third (n=30; 35.7%) used BBM; and 19 (22.6%) students used Mixit. Fewer 12 (14.3%) students used Twitter; 8 (9.6%) used email; one (1.2%) used SMSs; one (1.2%) used 2GO; and one (1.2%) student did not give any indication of what mobile application was being used (\bar{x} =10.56; SD=5.889) (Table 4.3).

Table 4.3: Student use of applications on mobile device (n=84)

Mobile applications being used by student participants	Sample	Percentage
WhatsApp Messenger	66	78.6
Facebook	63	75.0
Blackberry Messenger (BBM)	30	35.7
Mixit	19	22.6
Twitter	12	14.3
Email	8	9.6
SMS	1	1.2
2GO	1	1.2
No indication	1	1.2

Lecturers and clinical facilitators indicated their use of applications on their mobile devices (Table 4.4) with a wide distribution around the mean value (\bar{x} =0.633; SD=3.445). Participants indicated various uses of applications: four (66.7%) lecturers and clinical facilitators used WhatsApp Messenger; four (66.7%) used BBM; and three (50.0%) used Facebook. Only one (16.7%) used Twitter; one (16.7%) used Mixit; and one (16.7%) did not give an indication.

A study by Diliberto-Macaluso and Hughes (2016) found that students enjoyed the use of mobile devices, specifically mobile applications, in class and it enhanced student learning. It was recommended that applications be developed by educators to enhance the development of innovative learner-centered activities and to promote collaborative learning. Instructional training should be made available to educators in how to develop their own applications to implement in their courses (Diliberto-Macaluso & Hughes, 2016).

Table 4.4: Lecturers and clinical facilitators use of applications on mobile device (n=6)

Mobile applications being used by student participants	Sample	Percentage
WhatsApp Messenger	4	66.7
Blackberry Messenger (BBM)	4	66.7
Facebook	3	50.0
Mixit	1	16.7
Twitter	1	16.7

It could be concluded that WhatsApp Messenger was identified as the mobile messaging application of choice for a m-learning intervention.

Mobile applications most suitable for task-related coursework (Students Item 13; Lecturers and clinical facilitators Item 14)

Cost attached to the purchase of mobile devices and privacy concerns when downloading and using mobile applications are often mentioned as reasons for educators' reluctance to adopt m-learning initiatives in their teaching and learning practices (Alrasheedi & Capretz, 2015; Crompton, 2013). The use of mobile applications would be an important guide for establishing which application would be most suitable to review tasks from lecturers and clinical facilitators related to course work. In this item, students identified two applications that they were most comfortable to use for task-related communication.

The results showed that the majority, 64 (76.2%) students, used email communication; two-thirds, namely 54 (64.3%) students, identified WhatsApp Messenger; almost half, 39 (46.4%) students, indicated Facebook; 23 (27.4%) students indicated BBM; nine (10.7%) students indicated Mixit; and eight (9.5%) students indicated Twitter ($\bar{x}=10.42$; $SD=5.704$). The multiple responses allowed for this question influenced the internal consistency of the data set.

The majority of students indicated that they were interested in email communication to review tasks received from lecturers and clinical facilitators, while WhatsApp Messenger was the application of choice on their mobile devices to review tasks received from lecturers and clinical facilitators (Table 4.5).

Table 4.5: Students' application of choice to review tasks (n=84)

Mobile applications being used by student participants	Sample	Percentage
Email	64	76.2
WhatsApp Messenger	54	64.3
Facebook	39	46.4
BBM	23	27.4
Mxit	9	10.7
Twitter	8	9.6

Reponses received from lecturers and clinical facilitators to review tasks of students included: five (83.3%) lecturers and clinical facilitators indicated that they were interested in email; two (33.3%) indicated WhatsApp Messenger; one (16.7%) indicated BBM; one (16.7%) indicated Facebook; one (16.7%) indicated blogging; and one (16.7%) indicated Flickr ($\bar{x} = 0.633$; $SD = 2.733$) (Table 4.6).

Table 4.6: Lecturers and clinical facilitators' application of choice to review tasks (n=6)

Mobile applications of choice to review tasks	Sample	Percentage
Email	5	83.3
Whatsapp Messenger	2	33.3
Facebook	1	16.7
BBM	1	16.7
Twitter	1	16.7
Blog	1	16.7
Flickr	1	16.7

Although some of the lecturers and clinical facilitators made use of Blackberry Messenger (BBM), a study by Ifenyi-obi, Olatunji and Enyindah (2014) found that, although the use of BBM impacted positively on the academic activities of agricultural students at the University of

Port Harcourt, the misuse of this innovation by certain students had negative results on their academic performances.

The fact that 64 (76.2%) students showed interest in reviewing tasks from lecturers and clinical facilitators via email was an interesting finding, since only eight (9.6%) students indicated that they used their mobile devices for accessing their email. It was interesting to find that none of the lecturers and clinical facilitators used email in their daily communication, yet five (83.3%) lecturers and clinical facilitators indicated that they were interested in using email to review tasks received from students related to their coursework.

On review of the mobile applications being used by students, lecturers and clinical facilitators, the most suitable application to receive tasks related to coursework was identified as WhatsApp Messenger.

It could be concluded that WhatsApp Messenger is most suitable for receiving or reviewing course-related tasks, supported by email for larger documents.

Using mobile devices to communicate and enhance ITCP (Students Item 14; Lecturers and clinical facilitators Item 15)

The affordances of modern mobile technologies provide tools to enhance teaching and learning, but the effectiveness is dependent on an evidence-based learning design framework (Lim & Churchill, 2016). Charm and Wishart (2015) acknowledge that nursing students may not have the necessary theoretical and clinical knowledge when commencing their nursing practicum in the various specialities.

The use of mobile devices was introduced when students were in their clinical practicum areas to enhance their learning opportunities. In some areas students were not able to use their mobile devices due to the workload. The mobile devices did however afford students with an opportunity to search for information on a nursing diagnosis, nursing procedures, drug information, to take notes and to complete calculation (Charm & Wishart, 2015).

On review, 79 (94.0%) students indicated that they believed that mobile devices could be used to enhance ITCP of the ENT health assessment in the PCCSM and only five (6.0%) students believed they could not use it ($\bar{x}=1.07$; $SD=0.258$).

There were four (66.7%) lecturers and clinical facilitators who indicated that they already used their mobile devices to assist students with ITCP of the ENT health assessment. Two (33.3%) lecturers and clinical facilitators did not use their mobile devices for assisting students with ITCP ($\bar{x} = 1.33$; $SD = 0.516$). In response to an open question, a lecturer or clinical facilitator mentioned: “Mobile devices will enhance integration between theory and clinical practice for our students in many modules and teaching platforms”. “More convenient in a sense that mobile phones are portable, on the run”.

Song, Murphy and Farley (2013) reported on the use of mobile devices for learning in Malaysia. The research established that the increase in research activity focused around mobile learning in higher education in Malaysia corresponded with the increased use of mobile devices for learning by students to support their studies (Song, Murphy & Farley, 2013). In the mentioned study mobile devices were provided to the students free of charge and they received a one-year mobile service package that motivated them to make full use of their mobile devices. Student interaction with their mobile devices were affected by interrelated factors such as goals, tasks, learning resources, mobile device capabilities and constraints, time and place, social factors, and individual interpretations.

Learning tasks of the students also varied according to the task at hand, e.g. tasks defined by the teacher (e.g. writing project reports), tasks defined by the student (e.g. course review) and tasks emerging in context (e.g. recording lectures in class).

It can be concluded that mobile devices could be used to enhance ITCP of the ENT health assessment.

4.2.4 Section D: Communication

During clinical courses in nursing practice, m-learning has been used to amalgamate instructors, peers and resources by using mobile devices at the point-of-care to enhance students’ safety and evidence-informed practice (Kenny, Van Neste-Kenny, Burton, Park & Qayyum, 2012).

Preferred method of communication (Students Items 15–19; Lecturers and clinical facilitators Items 16–20)

An overview is presented of the preferred method of communication used by students (Figure 4.15) and lecturers and clinical facilitators (Figure 4.16). Participants had to respond to this

structured question by indicating on the Likert scale to what extent they disagreed or agreed with a given statement (never=1; hardly ever=2; sometimes do=3; frequently=4; always=5).

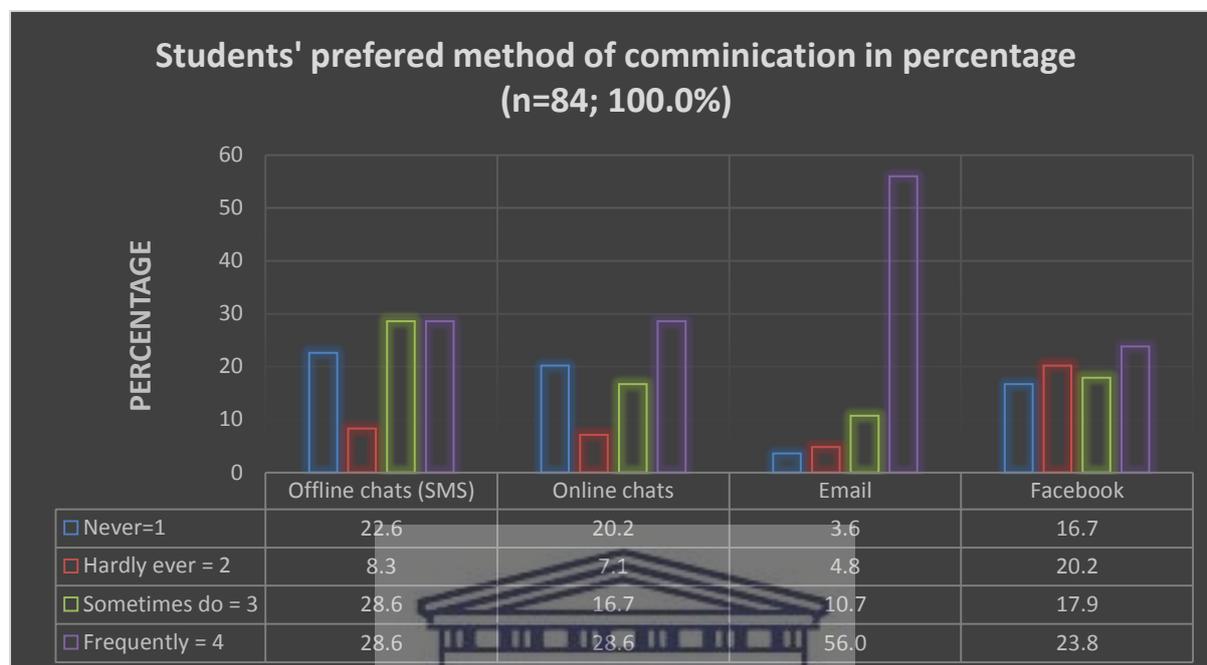


Figure 4.15: Students' preferred method of communication

Email was the preferred method of communication used by 47 (56%) students (Item 17: \bar{x} =4.21; SD=1.146), while 24 (28.6%) students preferred offline chats (Item 15: \bar{x} =3.21; SD=1.440); 24 (28.6%) preferred online chats (Item 16: \bar{x} =3.51; SD=1.502); 20 (23.8%) preferred an online network community, e.g. Facebook (Item 18: \bar{x} =3.28; SD=1.469); and only three (3.6%) preferred blogging (Item 19: \bar{x} =1.77; SD=1.151) as a method of communication.

Almost a quarter of the students indicated an online chat, e.g. WhatsApp Messenger, as their most frequently used method of communication, while 56% still indicated email (Figure 4.16).

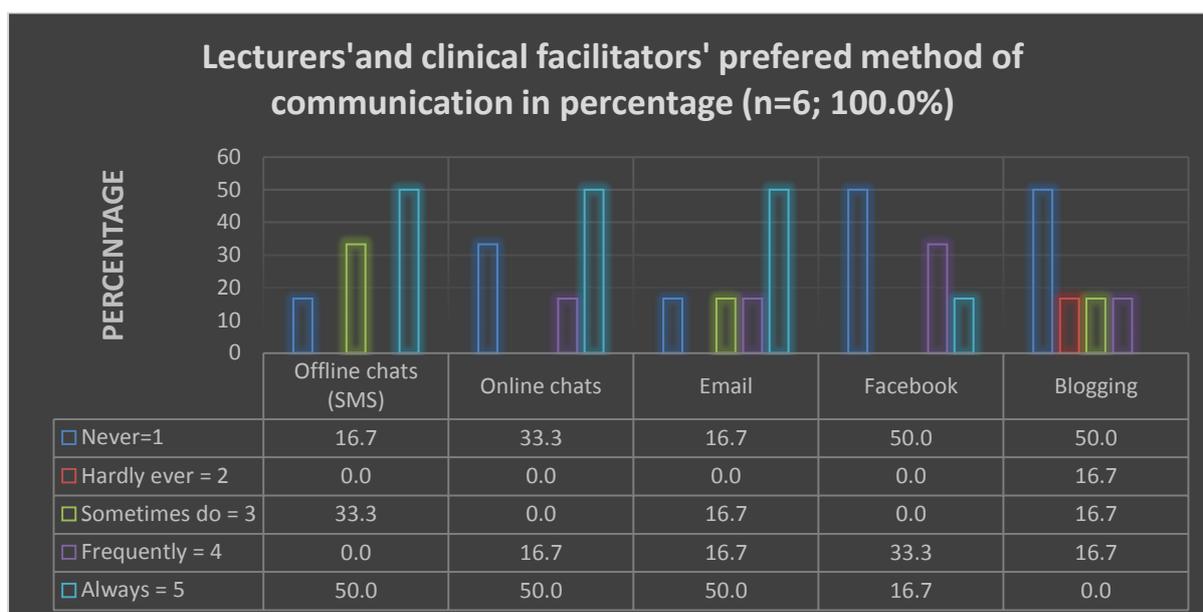


Figure 4.16: Lecturers' and clinical facilitators' preferred method of communication

Three (50%) lecturers and clinical facilitators preferred offline chats, e.g. SMS (Item 16: \bar{x} =3.67; SD=1.633) as mode of communication, while three (50%) preferred online chats, e.g. WhatsApp Messenger (Item 17: \bar{x} =3.50; SD=1.975); another three (50.0%) always used email (Item 18: \bar{x} =3.83; SD=1.602); one (16.7%) lecturer and clinical facilitator used Facebook (Item 19: \bar{x} =2.67; SD=1.862); and one (16.7%) lecturer and clinical facilitator indicated that blogging was frequently used as a preferred method of communication (Item 20: \bar{x} =2.00; SD=1.265).

Even though student participants were clear that email were their preferred method of communication, it was not as strongly indicated by lecturers and clinical facilitators.

It could be concluded that the use of emails is commonly used among students and to a lesser extent by lecturers and clinical facilitators.

Use of mobile devices to enhance ITCP (Students Item 21; Lecturers and clinical facilitators Item 22)

Handheld or mobile devices provide nurses with a reference library in their pockets. Depending on their Internet connectivity, nurses are able to search for drug formularies, or textbooks or journal information about the latest evidence-based practices. The latter was confirmed in a study among community health students from Northumbria University in the United Kingdom

that indicated that mobile technology is used to access clinical applications, such as electronic textbooks and medical calculators (Walton, Childs & Blenkinsopp, 2005).

In an open question (Item 21), affirmative and adverse responses were made by students regarding the use of mobile devices to enhance ITCP of the ENT health assessment. The majority (n=57; 67.85%) indicated with a “yes” statement that mobile devices could be used to enhance ITCP of the ENT health assessment. Some examples of both positive and adverse responses are given (Table 4.7) (Item 21: \bar{x} =1.07; SD=.258).

Table 4.7: Use of mobile devices to enhance theory and clinical practice

Responses by students
Some positive responses
Mobile devices are easier, more accessible, faster and time-saving.
More convenient in a sense that mobile phones are portable, on the run.
Mobile devices can be useful because when the lecturer or the students are not physically available, they can still communicate via whatever means possible.
Should transport be an issue, particularly financially or due to a lack of time, the mobile devices allow for quick, easy communication without the unnecessary costs.
Chance for a student to ask questions to your lecturer related to the study or any module they are struggling with anytime.
We would be more up to date with our facts. We would have information readily on hand if there is a case where we are unsure of ourselves or do not have enough information.
It makes everything easier and saves time.
Mobile devices are the way to the future. We are on track with technology to make our lives easier.
Some adverse responses
Not if everyone does not have the availability.
Sometimes my phone doesn't open large files; that's why most of the time I choose to use email account.

In the open question to lecturers and clinical facilitators regarding the use of mobile devices to enhance ITCP of the ENT health assessment, six affirmative responses (n=6; 100.0%) were received (\bar{x} =3.00; SD=1.414):

“Yes, if planned properly and students and lecturers get orientation on how [to] use the service, it can be achieved” (ITCP)

“Technology is a cheaper form of communication for both students and lecturers to enhance learning and immediate feedback, debates”

“Used effectively if [you] want to know more/did not understand something clearly - immediate connect for clarification”

The use of mobile devices would not only be a cheaper and effective form on online communication, but it would also make research easier, allowing access to electronic textbooks, drug formularies, etc. while in clinical placement facilities.

It could be concluded that mobile technology would be a cheaper and more effective form of communication if students, lecturers and clinical facilitators are prepared well for the intervention.

Distribution of content to students using mobile devices (Students Item 22; Lecturers and clinical facilitators Item 23)

It could be argued that m-learning could be effective in supporting the teaching and learning of nursing students, for example, with students integrating theory into their practice. Fundamental changes in curriculum design and delivery at HEIs using the appropriate emerging technology could provide students in the 21st century with an opportunity to enhance their learning (Bates & Sangra, 2011). Resource material would have to be made available to lecturers and clinical facilitators who are not able to access online resources to ensure a continuation in support to students to enhance their ITCP.

One (16.7%) of the six (100.0%) lecturers and clinical facilitators indicated that he/she would never be able to find and distribute course-related content to students from the Internet by means of a mobile device. One (16.7%) indicated that he/she would hardly ever, while positive responses of four lecturers and clinical facilitators collectively ranged between sometimes do (n=1; 16.7%); frequently do (n=1; 16.7%); and always (n=2; 33.3%). It would appear that some

of the lecturers and clinical facilitators were already able to find and distribute content to students from the Internet that was relevant to the course content by means of their mobile devices (Item 23: \bar{x} =3.17; SD=1.472).

It can be concluded that the majority of lecturers and clinical facilitators would be able to access and distribute course-related content to students using the Internet via their mobile devices.

Student use of mobile device to chat with lecturers and clinical facilitators (Students Item 23; Lecturers and clinical facilitators Item 27)

The adoption of technology in HEIs requires clear policy guidelines, ensuring device availability and access to technical and pedagogical support. Effective training and administrative and technical support have to be in place to ensure that students and educators have the necessary skills and support to engage formal digital literacy (Johnson *et al.*, 2014). A study on the use of mobile phones for academic purposes by law students at Igbinedion University, Okada, Nigeria (Mamudu & Oyewo, 2015), discovered that the time spent by students on the Internet using their mobile devices could be used for academic purposes. The assumption was that there may then be a gradual academic improvement and a culture of reading could be established (Mamudu & Oyewo, 2015). The availability of educators to support students to achieve academic improvement using their mobile devices would be important.

Students (n=84; 100.0%) were requested to indicate if they use their mobile devices to chat with their lecturers and clinical facilitators using WhatsApp Messenger, Mixit, Facebook, etc. to access academic support. A total of 44 (52.4%) students indicated that they never use their mobile devices to chat with their lecturers and clinical facilitators using WhatsApp Messenger, Mixit, Facebook, etc. to access academic support; 13 (15.5%) indicated that they sometimes do; 13 (15.5%) indicated that they frequently do; 11 (13.1%) indicated hardly ever; while only three (3.6%) indicated that they always do (\bar{x} =2.35; SD=1.307).

Three (50.0%) of the lecturers and clinical facilitators indicated that they would never use their mobile devices to chat with students via WhatsApp Messenger, Mxit, Facebook, etc. and to offer them academic support. One (16.7%) lecturer or clinical facilitator indicated a frequent use of mobile devices to chat with students, while two (33.3%) indicated that they always used their mobile devices to chat with students (\bar{x} =2.83; SD=2.041).

The findings indicate that there may be an absence of information shared with student in “real-time” since there is a 50/50 indication for and against the use of their mobile devices by lecturers and clinical facilitators to chat with students via WhatsApp Messenger, Mxit, Facebook, etc. and to offer students’ academic support.

It could be concluded that students were not making use of available technology as yet for academic support despite it being an affordable method of communication.

Willingness to engage with mobile devices to help with ITCP (Students Item 24; Lecturers and clinical facilitators Item 28)

Students (n=84; 100.0%) were asked to indicate their willingness to engage with mobile devices to help them with the integration of the theory and clinical practice of the ENT health assessment. A total of 39 (46.4%) students indicated that they would always be willing to engage with mobile devices to integrate the theory and clinical practice; 23 (27.4%) indicated that they would frequently be willing to do so; 14 (16.7%) indicated that they would sometimes be willing; six (7.1%) indicated that they would hardly ever be willing; while only two (2.4%) indicated that they would never be willing ($\bar{x}=4.23$; $SD=0.972$).

Lecturers and clinical facilitators (n=6; 100.0%) were asked to indicate their willingness to engage with mobile devices to help students with the integration of the theory and clinical practice of the ENT health assessment. Three (50.0%) of the lecturers and clinical facilitators indicated that they would always be willing to do so; two (33.3%) indicated that they would frequently be willing to do so; while one (16.7%) indicated that he/she would sometimes be willing (Figure 4.17) ($\bar{x}=0.433$; $SD=0.816$).

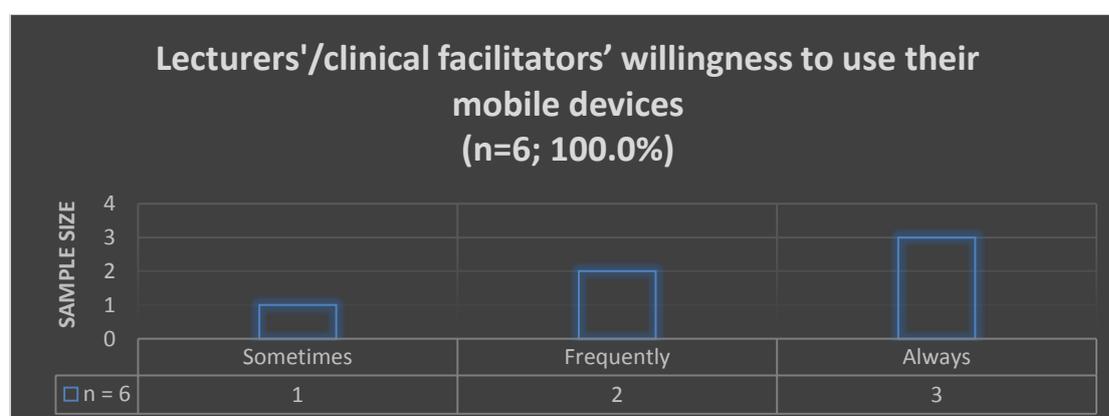


Figure 4.17: Willingness of lecturers and clinical facilitators to use their mobile devices

The need still existed to obtain the endorsement of all lecturers and clinical facilitators to use their mobile devices, e.g. smartphones, notebooks, laptops, etc. to assist students with ITCP in this course. The attitudes of students and their educators towards the use of technology in teaching and learning play an imperative role in their willingness to use mobile devices for teaching and learning (Adov, Must & Pedaste, 2017).

It can be assumed that, as the majority of students responded positively, students would be willing to participate in a m-learning intervention. During the workshop, a positive attitude will have to be cultivated among lecturers and clinical facilitators towards the use of their mobile devices to assist students with the integration of their theory and clinical practice.

Ability to develop content in an online learning environment for students using mobile devices (Lecturers and clinical facilitators Item 24)

King, Lewis-Miller and Bayer (2017) specify that technological competency encompasses the ability to use and understand previous and emerging technologies (physical and digital), allowing the user to complete various tasks and to find solutions to problems.

Two (33.3%) of the lecturers and clinical facilitators indicated that they would always be able to develop online content in an online learning environment for students, while one (16.7%) indicated that he/she would frequently be able to; one (16.7%) indicated that he/she would sometimes be able to; one (16.7%) indicated that he/she would hardly ever be able to; and one (16.7%) indicated he/she would never be able to develop online content in an online learning environment for students (\bar{x} =3.33; SD=1.633).

Training would have to be provided to ensure that lecturers and clinical facilitators have the technical competence for the m-learning intervention.

It can be concluded that a workshop would be needed to assist lecturers and clinical facilitators with the use of their mobile devices to develop content in an online learning environment.

Use of mobile device to send course information to students (Lecturers and clinical facilitators Item 25)

Alrasheedi and Capretz (2015) identify that with the increased use of smartphones among students, research around the use of mobile devices to facilitate teaching and learning initiatives

have increased at universities. Ownership and use of a smartphone could afford the access to and distribution of course-related material between students and lecturers and clinical facilitators.

Two (33.3%) of the lecturers and clinical facilitators indicated that they would always be able to use their mobile devices in their teaching approach to communicate course information to students, while one (16.7%) indicated that he/she frequently would be able to do so; one (16.7%) indicated he/she would sometimes be able to; one (16.7%) indicated he/she would hardly ever be able to; and one (16.7%) indicated he/she would never be able to do so ($\bar{x}=3.33$; $SD=1.633$).

It can be concluded that a workshop would be needed to reinforce the benefits of using mobile devices to send course information to students.

Current use of mobile device to review course-related pictures and videos from students (Lecturers and clinical facilitators Item 26)

Gašević, Dawson and Siemens (2015) claim that educational technology has been transformed, through three distinct generations of development. The fourth generation, one of technological development, involves the distribution of digitally shaped technologies supported by adaptive learning, distributed infrastructures and competency models. Education using videos is one of the elements of “distributed interactions” that explores the role that video plays within education (Siemens, Gašević & Dawson, 2015).

Two (33.3%) of the lecturers and clinical facilitators indicated that they hardly ever used their mobile devices to review course-related pictures and videos made by students. The other four lecturers and clinical facilitators each selected one of the remaining categories: never (16.7%); sometimes (16.7%); frequently (16.7%); and always (16.7%). There would be a need to further explore the reasons for this phenomenon to ensure real-time feedback and availability of appropriate information or resource material to students in an effort to increase learning and retention ($\bar{x}=2.83$; $SD=1.472$).

It can be concluded that a workshop would be needed to reinforce the benefits of using mobile devices to review course-related pictures and videos made by students.

4.3 SUMMARY OF RESULTS

The results revealed the extent of students’ and lecturers and clinical facilitators’ use of mobile devices for ITCP of the ENT health assessment in the PCCSM. In a modern society of mobile

technology, students and lecturers and clinical facilitators should be educated to use mobile devices to enhance quality teaching moments.

The study into the knowledge of student and lecturers and clinical facilitators about the potential use of mobile devices in an undergraduate nursing module indicated that their preferred method of interaction is via the social networking services of WhatsApp Messenger (79.8%), Facebook (75.0%) and Mxit (22.6%). Lecturers and clinical facilitators indicated that they made use of WhatsApp Messenger, Mxit, Facebook and other applications to offer academic support to students. In another study among physiotherapy students about the knowledge about and attitudes towards the use of social applications, a few students indicated that they have had a high level of interaction with some common social networking services, e.g. Mxit (84.0%) and Facebook (81.0%).

Although the results in this study indicated that 79 (94.0%) student participants believed that mobile devices could be used to improve the integration of the theory and clinical practice of the ENT health assessment, no specific application was identified with which to facilitate this process. The lecturers and clinical facilitators' survey results indicated that there was a need for increased endorsement by lecturers and clinical facilitators to engage with mobile devices with the purpose of assisting students with the integration of the theory and clinical practice of the ENT health assessment in the PCCSM. Some lecturers and clinical facilitators had already started using their mobile devices to assist students with ITCP, yet there were lecturers and clinical facilitators who were not prepared to use their mobile devices for assisting students with the integration of the theory and clinical practice of the ENT health assessment.

The quantitative survey explored the knowledge of participants about the potential use of mobile devices to integrate the theory and clinical practice of the ENT health assessment in the PCCSM through m-learning. The study found that 79.8% of the student population were using mobile devices on a daily basis.

An exploration into the knowledge of students on the use of social media applications concluded the following: WhatsApp Messenger (79.8%); Facebook (75%); Mxit (22.6%); etc., while lecturers and clinical facilitators indicated that they made use of WhatsApp Messenger; Mxit; Facebook; and other applications to offer academic support to students. However, it was interesting that when students were asked which application was the most suitable for receiving

tasks from their lecturers and clinical facilitators related to coursework, 76.2% indicated email; 64.3% WhatsApp Messenger; and 46.4% Facebook. The difference in the results of the two questions identified the need for clarification and deeper exploration of some of the results from the survey. The need to conduct a qualitative study was identified, for example through focus group discussions (FGDs) and individual interviews, supported by observational notes, to refine and extend the general overview developed from the quantitative survey.

The majority students and lecturers and clinical facilitators understand how to use a mobile device as they have been using their individual mobile devices for more than six months. Students and lecturers and clinical facilitators furthermore indicated that they learned how to use their mobile devices on their own. Help from a consultant from a mobile network company would not be allowed when problems were experienced with their mobile devices to ensure the confidentiality of patients' information. A preparatory workshop is required to determine if the mobile devices of individuals would be suitable to use in a m-learning intervention. It was identified that the best time for a m-learning intervention would be at any available time.

Course-related resources should be made available during a m-learning intervention as difficulties were experienced with accessing library search engines off-campus. The results indicate that a positive attitude will have to be nurtured towards the use of personal mobile devices for a m-learning intervention. Also, a positive attitude will have to be cultivated among lecturers and clinical facilitators towards the use of personal mobile devices to assist students with the integration of their theory and clinical practice.

The results furthermore indicate that it is believed that mobile devices could be used to enhance ITCP. WhatsApp Messenger was identified as the mobile messaging application of choice for a m-learning intervention and it was indicated as most suitable for receiving or reviewing course-related tasks, supported by email for larger documents. Mobile technology was identified as a cheaper and more effective form of communication if students, lecturers and clinical facilitators are prepared well for the intervention.

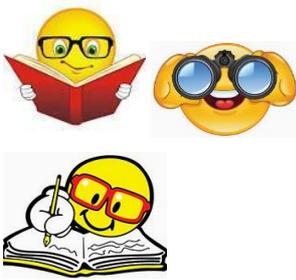
4.4 CONCLUDING STATEMENTS IDENTIFIED AS DRAFT DESIGN PRINCIPLES

Table 4.8 outlines the conclusions of Chapter 4. These conclusions will form part of the design principles that need to be included in the intervention (enactment) in Chapter 7, supported by the most relevant affordances (Bower, 2008) for each principle.

Colour key chart

	Authentic learning		Situated learning		Flexible learning		Social Constructivism		Blended learning
--	--------------------	--	-------------------	--	-------------------	--	-----------------------	--	------------------

Table 4.8: Rules identified as draft design principles

DRAFT DESIGN PRINCIPLES		AFFORDANCE	
	Students and lecturers and clinical facilitators should understand how to use a mobile device as the majority have been using it for more than six months.	Integrate-ability Combine-ability	
	Students and lecturers and clinical facilitators should familiarise themselves with the functions of mobile devices while using them.	Integrate-ability Combine-ability	
	Students and lecturers and clinical facilitators will seek the help of a consultant, the researcher, when experiencing problems with their mobile devices.	Accessibility	
	There has to be a preparatory workshop to determine if the mobile devices of participants would be suitable prior to a m-learning intervention.	Readability View-ability Write-ability	
	The best time for a m-learning intervention would be at any available time as the majority of students and lecturers and clinical facilitators indicated.	Accessibility	
	Resources will have to be made available during a m-learning intervention due to challenges to access library search engines off-campus.	Share-ability Browse-ability	

	A generalised positive attitude towards the use of personal mobile devices for a m-learning intervention will have to be nurtured among students.	Focus-ability	
	A positive attitude will have to be cultivated among lecturers and clinical facilitators to use their mobile devices to assist students with the integration of their theory and clinical practice.	Focus-ability Integrate-ability	
	Mobile technology would be a cheaper and more effective form of communication if students and lecturers and clinical facilitators are prepared well for the intervention.	Accessibility	
	Mobile devices can be used to enhance ITCP.	Integrate-ability	
	WhatsApp Messenger was identified as the mobile messaging application of choice for a m-learning intervention.	Accessibility	
	WhatsApp Messenger is most suitable for receiving or reviewing course-related tasks, supported by email for larger documents.	Accessibility Share-ability Browse-ability	
	Lecturers and clinical facilitators are able to access and distribute course-related content to students on the Internet via their mobile devices.	Search-ability Link-ability Share-ability	
	Lecturers and their clinical facilitators would need to be reassured about the benefits of mobile devices and how to use them to: develop content in an online learning environment; review course-related pictures and videos made by students; and communicate with students and offer them academic support.	Search-ability Link-ability Share-ability	

4.5 CONCLUSION

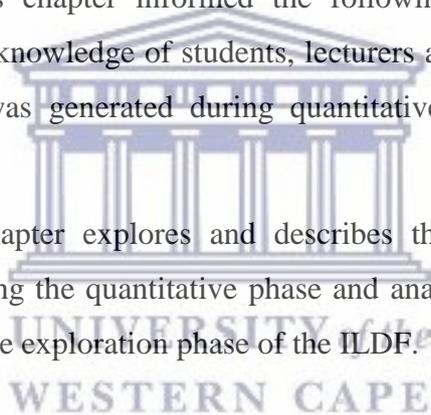
This quantitative explorative chapter (*Objective 1*) includes the findings and discussion of the knowledge of students and lecturers and clinical facilitators about the affordances of mobile devices to integrate theory and clinical practice of the ENT health assessment in the PCCSM through m-learning.

This chapter was preceded by a literature review, the commencement of the exploration phase that informed the development of an electronic survey. The survey explored and described the knowledge of students, lecturers and clinical facilitators about the affordances of mobile devices to integrate theory and clinical practice of the ENT health assessment in the PCCSM. The results of the survey indicated the need for a workshop on the use of mobile applications. A workshop will ensure that no student is disadvantaged (e.g. due to a lack of knowledge) when the use of a device to improve ITCP for ENT health assessment in the PCCSM is introduced.

The results and discussion of the quantitative data collected included the analysis of the results of the electronic survey, presented through a detailed discussion of the research instrument, the sample characteristics statistics and the descriptive and inferential statistics.

The following chapter (*Objective 2*) represents the findings and a discussion of the qualitative data collection process. This chapter informed the following chapter in which a general overview of the extent of the knowledge of students, lecturers and clinical facilitators regarding the use of mobile devices was generated during quantitative investigation (*Objective 1*) is outlined.

The following qualitative chapter explores and describes the extent to which the general overview was developed during the quantitative phase and analysis of data of the instructional and training contexts within the exploration phase of the ILDF.



5 CHAPTER: QUALITATIVE RESULTS AND DISCUSSION



“Education is the most powerful weapon you can use to change the world.”

Nelson Rolihlahla Mandela

5.1 INTRODUCTION

This chapter includes Phase 1, Objective 2, which is:

to explore and describe the perceptions of students and lecturers and clinical facilitators on the integration of theory and clinical practice (ITCP) of the ENT health assessment in the primary care and clinical skills module (PCCSM) through m-learning in an undergraduate nursing programme at an HEI in the WCP.

The chapter represents the results of the qualitative data collection process as informed by the general overview generated in the quantitative investigation into the extent of the knowledge of students and lecturers and clinical facilitators regarding their use of mobile devices. According to Patton (2002), “qualitative analysis transforms data into findings. No formula exists for that transformation. Guidance, yes. But no recipe. Direction can and will be offered, but the final destination remains unique for each inquirer, known only when—and if—arrived at” (Patton, 2002).

The findings of Objective 2 informed Objective 3, which was to develop a plan for the intervention for the ITCP of the ENT health assessment. This is within the PCCSM through m-learning in an undergraduate nursing programme at an HEI in the WCP.

Included in this chapter is a detailed discussion of the results of the data analysis, comprising:

- focus groups and individual, semi-structured interviews with students; and

- a focus group discussion, conceptualisation discussion group and individual semi-structured interviews with lecturers and clinical facilitators.

The conceptualisation group discussion refers to the session held with lecturers and clinical facilitators to discuss the findings of the literature review (Chapter 3), and quantitative (Chapter 4) and qualitative (Chapter 5) data analysis. During this session, the practicality of the plan being developed for the intervention was discussed. The conceptualisation discussion group provided a platform for the researcher to clarify any uncertainties harboured by lecturers and clinical facilitators regarding the plan developed (Chapter 6) for the intervention (Chapter 7).

Data analysis was executed on an excel spreadsheet, guided by Tesch's data analysis method (1990), as cited by Creswell (2014). The transcriptions of the data collected from participants were analysed (Tesch, 1990) to develop themes and sub-themes in an inductive way as directed by the content of the data (Braun & Clarke, 2006). In this chapter, the results of every theme and category identified are presented in the form of a discussion, with extractions from responses, supported by relevant literature to contextualise the findings.

Based on the findings, the following databases were searched to support the findings: EBSCOhost, SpringerLink, MEDLINE (Medical Literature Online), Academic Search Premier, Nexus, CINAHL (Computer Index to Nursing and Allied Health Literature), Science Direct, Scopus, Google, Google Scholar and the library resources. The keywords that were used included: affordances, m-learning, mobile devices, undergraduate programme, nursing, students, educators, design-based research (DBR), authentic learning, flexible learning, emerging technology, teaching and learning, higher education, HEI, WhatsApp, WhatsApp Messenger in undergraduate nursing, Facebook, Facebook in undergraduate nursing, email, and email in undergraduate nursing. The literature searched was collected, assimilated and integrated into the findings and discussions from the collected data was analysed.

5.2 OVERVIEW OF PARTICIPANTS

The accessible population of the qualitative phase included third-year undergraduate nursing students (N=84) registered for the PCCSM, a semester module, and their lecturers and clinical facilitators (N=6) who facilitated the module. Purposive sampling was conducted. In total, four student focus groups (SFGs) and eight individual semi-structured interviews (ISSIs) with

students were conducted. On the other hand, one focus group (LCFG), one conceptualisation discussion group (CDG) and three ISSI were held with lecturers and clinical facilitators (Table 5.1). Initially, six focus groups (three from each of the two classes registered for the PCCSM) were planned with students, but individuals from both classes withdrew from the study. Data saturation was, however, reached with the four focus groups (two from each class).

Table 5.1: Qualitative data collection summary

Data collection method	Abbreviation	Participants
Student focus group 1	SFG 1	6 participants (3 males and 3 females)
Student focus group 2	SFG 2	6 participants (2 males and 4 females)
Student focus group 3	SFG 3	6 participants (2 males and 4 females)
Student focus group 4	SFG 4	6 participants (3 males and 3 females)
Lecturers and clinical facilitators focus group	LCFG	5 participants (2 males and 3 females)
ISSIs with students	ISSI	8 participants (2 males and 6 females)
ISSIs with lecturers and clinical facilitators	ISSI	3 participants (1 male and 2 females)
CDG with lecturers and clinical facilitators	CDG	5 participants (1 male or 4 females)

A total of ten ISSIs were planned with student participants, but after carrying out eight interviews with students and three with lecturers and clinical facilitators, no new or relevant data emerged, and it was evident that theoretical saturation had been reached. This implies that no new or relevant data in the themes or sub-themes emerged. The properties of the data are therefore representative to the extent that validation can be confirmed, and the relationship between the themes or sub-themes are well established and confirmed (Bryman, 2016; Kumar, 2005; Strauss & Corbin, 1998). Age distributions of students ranged from 21 to 50 years. The age distributions of lecturers and clinical facilitators ranged from 26 to older than 50 years.

5.3 FINDINGS: STUDENTS

The students' verbatim transcriptions of the focus groups and ISSIs were collectively analysed. Ten main themes and a number of sub-themes were identified during the analysis of the focus group and the ISSIs conducted with student participants, as illustrated in Table 5.2.

Table 5.2: Themes and sub-themes (students)

Themes	Sub-themes
Mobile devices as a mode of communication	Limited availability of smartphones Mobile applications of choice Mobile devices used as a guide in clinical practice
Technology and web-based access	Convenient technology Limited access to technology Public Internet access
WhatsApp Messenger as a method of communication	WhatsApp is the best WhatsApp is affordable WhatsApp is user-friendly WhatsApp allows for instant response Creating a WhatsApp group
Email as a method of communication	Email is the best Email convenience Email as a second option Email and WhatsApp
Facebook as a method of communication	Creating a Facebook group for communication Facebook is often used by students Facebook not preferred for study purposes Privacy issues related to the use of Facebook Facebook versus WhatsApp
Email, WhatsApp Messenger and Facebook as methods of communication	
Maintaining professionalism within the clinical setting	Role of the Registered Nurse Nurses don't have time to explain Impact on professionalisms when using a mobile

	device in clinical practice
Teaching and learning methodology	Case-based methodology Paper case versus actual case Interactive case discussion
Setting personal boundaries	Access after hours Peer learning support via mobile devices
Other methods of communication	SMS as a method of communication Mxit as a fallen trend

The discussion in Chapter 5 will be focused on the data obtained in:

- each of the themes and sub-themes; and
- the main affordances of Bower (2008) in themes and sub-themes outlined in a grey block.

5.3.1 Theme 1: Mobile devices as a mode of communication

Student participants identified smartphones as an ideal communication tool, specifically to view emails. An interesting observation made was that smartphones were used more than laptops. Mobile devices made lecturers and clinical facilitators more accessible to students as the device made it easier to communicate, whether the student was on-campus or in clinical practice.

For me, a mobile device makes it easier for the communication part with your clinical supervisors and lecturers and for learning and studying. (ISSI; P 5)

What I'd like to say for smartphones: it is a good way to communicate for education. (SFG 1; P 4)

When I look here, emailing is the most application to use and also our mobile devices, those who have the phones, the smartphones they can use. (SFG 1; P 2)

Mobile devices are associated with wireless, small, portable, handheld devices, such as cellular phones, smart phones, personal digital assistants (PDAs), MP3 players, portable game devices, handhelds, tablets, notebooks and laptops (Wagner, 2005; Kukulska-Hulme & Traxler, 2005; Traxler, 2007). Wireless devices, as individualised and collaborative communication tools, have

the ability to extend learning beyond the classroom walls into areas such as hospitals, homes, airports, buses, taxis and trains, where students may not have direct or immediate access to a computer (Virvou, Troussas & Alepis, 2012). The size and portability of mobile devices make them ideal for communication between students and lecturers and clinical facilitators during a m-learning initiative.

Affordances identified (Bower, 2008)

Smartphones, with the temporal affordance accessibility, have been identified as the ideal communication tools.

Sub-theme: Limited availability of smartphones

Student participants identified that some students may not have access to mobile devices such as smartphones that can download the WhatsApp Messenger application. There was thus the concern that by owning an older or outdated mobile device, the individual would not be able to use the WhatsApp Messenger application, which could exclude them from the study.

I was just thinking about problems accessing WhatsApp from those phones, old ones, 2009 models, but now with the new phones, it's getting better. (SFG 1; P 4)

There are individuals that I know who don't have WhatsApp and cannot download it with their phones. (SFG 3; P 6)

The quantitative survey (Chapter 4) established that 66 students (78.6%) were able to connect to the Internet off-campus, and 66 (78.6%) were using WhatsApp Messenger and 63 (75.0%) were using Facebook. The conclusion was that the majority of students had access to smartphones with WhatsApp Messenger and Facebook. The study, therefore, recognised the limitation that some individuals were not able to participate in the study because they could not download the WhatsApp Messenger or Facebook application on their phones.

WhatsApp Messenger requires an Internet connection to allow the communication tool to send instant messages, photos, videos, voice messages and to make voice calls (Giordano, Koch, Godoy-Santos, Belangero, Pires & Labronici, 2017). A basic mobile device that is unable to access the Internet will thus not be able to download and make use of the WhatsApp Messenger

application. In many African countries, landline ownership is minimal and students may not necessarily be able to access broadband Internet.

Mobile devices can provide students with connectivity and the possibility of online and social learning. Mobile communication in Africa enables educators and students to search for and share knowledge, enabling the development of stronger educational frameworks (McNulty, 2016). The technical affordances of a mobile device thus allow it to be used on numerous platforms with minimal underlying technologies and with the ability to adapt to available bandwidth, connecting to the Internet with speed and efficiency (Bower, 2008).

Affordances identified (Bower, 2008)

The navigation affordance link-ability promotes contact-ability between students and lecturers and clinical facilitators, thus opening the lines of communication.

In this study, the notion of BYOD was embraced to support a m-learning intervention, as the researcher was not able to provide individuals with mobile devices such as smartphones.

I'm sure that not all of us here at school have smartphones. (SFG 4; P 3)

To address the notion of the limited availability of smartphones among students, the existence of a well-developed theoretical framework — one that supports creative pedagogies in which participants have to BYOD in order to participate in a study — had to be recognised (Cochrane *et al.*, 2014). Supporting creative pedagogies in the use of BYOD through the inclusion of collaborative practice with the established teacher communities of practice enhances learning about the affordances of mobile devices in relation to new models of student learning (Cochrane *et al.*, 2014).

It can be concluded that:

- To participate in a m-learning intervention, students and lecturers and clinical facilitators must be in possession of a mobile device (BYOD) that could be used on various platforms and could provide technical affordances such as the ability to adapt to available bandwidth and to connect to the Internet with speed and efficiency.
- Students should be able to contact lecturers and clinical facilitators from 08h00 to 16h00 daily (while students are in clinical practice).

Affordances identified (Bower, 2008)

Access-control, emphasis, media, navigation, spatial, synthesis and temporal affordances of smartphones were needed to participate in this research study.

Effective learning is dependent on the abilities of lecturers and clinical facilitators to encourage and support collaborative learning, thus the importance of an open line of communication is emphasised (Makoe, 2012). It has been widely publicised that the use of mobile applications has increased student participation in medical and dental education, enhanced the feedback process and improved communication between student and educator (Cochrane, 2014; Makoe, 2012; Nicholson, 2002; Bere, 2012).

It can be concluded that when designing a m-learning intervention and deciding on the most appropriate application to use the availability of mobile devices have to be determined.

Sub-theme: Mobile application of choice

Students identified specific applications during the survey that could be used as communication tools, including Facebook and WhatsApp Messenger. Students thought that their mobile devices were more accessible than a laptop or computer, with the added advantage of having access to the Internet. Students were furthermore of the opinion that individuals should be motivated to purchase smartphones with the balance of their bursary funds to have access to ongoing communication. It was also suggested that students should be encouraged to ask their parents to purchase them a mobile device with access to the WhatsApp Messenger application to ensure that they will not miss out on the “*on-going, real-time communication*” and be able to access their emails frequently.

WhatsApp is the most used under students at the moment. (SFG 1; P 1)

If you don't have a laptop or a computer, you do have a cell phone. You do have Internet access on your cell phone. (SFG 4; P 2)

Sung, Chang and Liu (2016) found that mobile devices have the potential to enhance educational effects but the actual impact of m-learning programmes has to be facilitated over longer periods. The researchers identified the need for a more defined integration of technology and the curriculum with further assessment of higher-level skills (Sung *et al.*, 2016).

It was identified that there were students who were still using the SMS to communicate. Using a SMS was not an option that was being explored for this research study due to the cost implication and because only one (1.2%) student indicated using a SMS in the quantitative survey (Chapter 4). The findings of Idrus and Ismail (2010) confirmed the challenges of using SMSs due to the cost implication.

There are people who still prefer SMSs because they don't have access to WhatsApp and Facebook. (SFG 4; P 3)

The concern was raised that, should the study use SMSs, the group may possibly not be able to participate in an interactive discussion.

Affordances identified (Bower, 2008)

The affordance of accessibility would provide ongoing real-time communication that was not as costly as the SMS.

It can be concluded that the mobile application of choice to enhance continued communication, especially in areas where students would not have access to a computer, would be WhatsApp Messenger, as using SMSs would be too costly.

Sub-theme: Mobile devices used as a guide in clinical practice

One participant mentioned that mobile devices could be used to produce and share videos using WhatsApp Messenger to demonstrate their clinical skills. Student participants agreed that mobile devices could be used to provide them with guidance while they were in clinical practice through the streaming of short instructional videos and being able to ask questions for clarification where indicated.

You can, like, short stream, like, videos, like, 1-minute videos that only shows maybe intricate parts, like, how to hold the torch. (SFG 2; P 5)

If you're using WhatsApp, you can easily ask the questions to your lecturers.

(SFG 3; P 1)

The use of mobile devices in clinical practice in health care is, however, still challenged by the receptivity of mentors and patients to students' use of mobile devices in the clinical environment (Ellaway, Fink, Campbell & Graves, 2013; Masters, Ellaway, Topps, Archibald & Hogue, 2016;

Pimmer & Pachler, 2014). Dunn and Hansford (1997) identify that clinical education is a very important component of the undergraduate nursing curriculum. The authors emphasised that new graduates must be able to develop theoretical knowledge as a foundation for the clinical skills needed to become a safe practitioner. Effective learning is also dependent on the abilities of the lecturers and clinical facilitators to encourage and support collaborative learning (Makoe, 2012).

Affordances identified (Bower, 2008)

Temporal affordances of smartphones such as accessibility, record-ability, playback-ability and synchronicity were identified to make and stream short instructional videos as a guide in clinical practice.

Students would have to be supported when they are challenged by facility personnel and patients while using their mobile devices to communicate or to do research related to the management of the patient. In this study, policy guidelines regarding the use of mobile devices were adhered to by students and lecturers and clinical facilitators as no verbal or written complaint was received from clinical facilities during the enactment phase.

It could be concluded that WhatsApp Messenger could be used to make and stream short, instructional videos of a clinical skill. It could also be used to ask questions and assist students with the application of theoretical knowledge.

5.3.2 Theme 2: Technology and web-based access

The global increase, availability and affordability of mobile devices have made them indispensable in day-to-day social networking, particularly by young people, giving them a sense of ownership while they engage with the devices (Pachler, Bachmair & Cook, 2010).

Sub-theme: Convenient technology

Students viewed Internet-supported technology as important in enabling communication and accessing information, thereby enhancing the integration of their theory and clinical practice. Not all clinical facilities in the WCP have Internet access available for students and one of the participants were fortunate enough to be placed at a clinical facility where there was access to the Internet.

We're very fortunate. There are some students out there that does not have the facility of using email at home or wherever they are. (SFG 1; P 1)

Depending on their Internet connectivity, nurses are able to search for drug formulas, or consult text books or journals about the latest evidence-based practices (George *et al.*, 2010). Bridging the gap in the continuation of learning while on-campus (formal learning), off-campus, or during their own time (informal learning) can be made possible with the application of mobile devices in teaching and learning (Cook, Pachler & Bradley, 2008). It is thus important for students to have access to the Internet and it was specified as an inclusion criterion for participation in the study.

Some participants expressed concerns that the views expressed in the study and choice of an accessible method of communication may not necessarily be acceptable to the students who will participate in the enactment phase of the study as new register for the module every semester.

We're choosing what is appropriate and what we want, what we can access.

(SFG 1; P 1)

Health care professionals' (HCPs) use of mobile technology has transformed many aspects of clinical practice. Mobile devices have become an everyday commodity within health care settings with the growth in the development of medical software applications (Ventola, 2014). The daily use of mobile devices has become an acceptable practice, but it would be pointless to have a mobile device without Internet access when attempting to enhance the learning experiences of students while in clinical practice. One of the major advantages of online education is its convenience as it allows flexibility in scheduling learning, but access to a computer and Internet connection is needed (Essays UK, 2017). Health care research on using mobile devices proved that students are encouraged to participate in this research study rather than question decisions made (Ventola, 2014).

Affordances identified (Bower, 2008)

Smartphones, as convenient technology, provide access-control, emphasis, media, navigational, spatial, synthetical and temporal affordances.

It could be concluded that there were concerns among students about making a decision about an accessible method of communication that may not be accepted by others.

Sub-theme: Public Internet access

Students who identified that access to the Internet was a challenge were informed that there was access to computers with free Internet services offered at The City of Cape Town's public libraries within the WCP. The Smart Cape facility in The City of Cape Town provides free Internet access to registered users. This facility currently has more than 360 000 registered users across The City of Cape Town. Among others, this initiative has provided students access to do research in order to complete projects and obtain health and wellness information (www.capetown.gov.sa).

The city introduced more computers now in the public libraries in our areas, we've got access to Internet 45 minutes free of charge. (SFG 1; P 4)

Other students process at the Internet café. R5.00 for 30 minutes. (SFG 1; P 2)

One participant indicated the affordability of access to the Internet off-campus at Internet cafes if students are unable to access the free Internet services at public libraries or if they don't have access to the Internet at home. Internet availability and its subsequent use is an important teaching and learning tool for the new generation (Sharahia, Ahmadi Goodarsi, Beigi & Joukar, 2014). A survey conducted by Brown and Czerniewicz (2007) in HEIs in the WCP indicated that a percentage of students make frequent use of Information and Communication Technologies (ICTs) for learning, even with poor Internet access.

It could be concluded that free or relatively cheap Internet connectivity is available off-campus.

5.3.3 Theme 3: WhatsApp Messenger as a method of communication

Students participating in the study collectively decided that mobile devices able to access WhatsApp Messenger, the cross-platform mobile messaging application, would be the most effective application to use to inform and guide them while in clinical practice. This can be done through the streaming of short instructional videos and opportunity to ask lecturers and clinical facilitators questions while managing a client. Students claimed that WhatsApp Messenger allowed easy and direct access to lecturers and clinical facilitators who were able to respond immediately to a query.

Because WhatsApp is easy to access and most of us have WhatsApp. (SFG 3; P 1)

Because it is instant I can quickly ask you, this is what the patient came with. This is my thought on what might be the problem. (ISSI; P 2)

But I think WhatsApp is a more logical option, because your communication is constant and instant. (SFG 4; P 2)

WhatsApp Messenger, a smartphone application that has been on the market since 2010, enables communication through an active Internet connection and can function on most current mobile devices. WhatsApp Messenger incorporates a diverse selection of functions, including sending and receiving text messages, and sending and receiving images, digital files, video files and links to web addresses. Over the past two years, the application has become very popular and has gained more than 350 million users (Bouhnik & Deshen, 2014).

Participants mentioned that WhatsApp Messenger was easy and quick to use, thus making it a convenient and accessible method of communication. The purpose of WhatsApp Messenger was to replace the SMS with an Internet-based platform providing unlimited text while evading the international fees that mobile providers may charge (Yeboah & Ewur, 2014).

Affordances identified (Bower, 2008)

The temporal affordance of accessibility supported the WhatsApp Messenger application on mobile devices, which allows access to communication at anytime and anywhere.

It is also evident from the tweet by Jan Koum on 24 August 2014 that WhatsApp Messenger is becoming a very popular application with 600, 000, 00 active monthly users (Figure 5.1).



Figure 5.1: Tweet by Jan Koum on WhatsApp Messenger users (2014)

The popularity of the application increased to one billion users and on 01 February 2016, the Business Insider reported that "That's nearly one in seven people on Earth who use WhatsApp each month to stay in touch with their loved ones, their friends and their family" (www.businessinsider.com). The founders of WhatsApp Messenger, Jan Koum and Brian Acton, sold WhatsApp Messenger to Facebook in 2014 for \$19 billion (www.dailymail.co.uk).

Statistics in July 2017 (Figure 5.2) indicated that the number of monthly active WhatsApp Messenger users worldwide is more than 1.3 billion (www.statista.com).

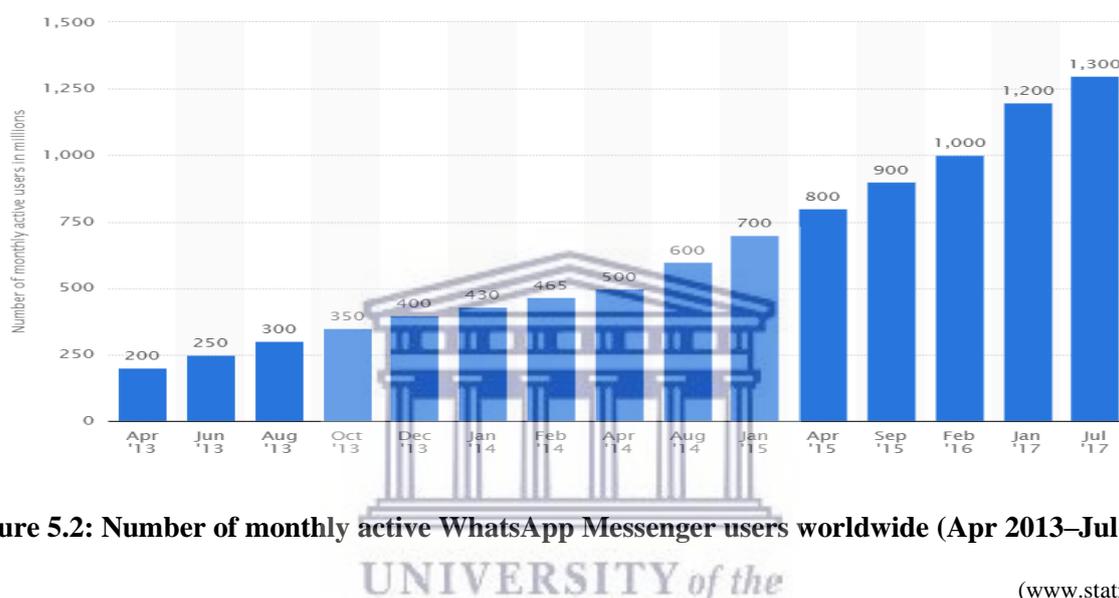


Figure 5.2: Number of monthly active WhatsApp Messenger users worldwide (Apr 2013–Jul 2017)

(www.statista.com)

The study participants of Church and de Oliveira (2013) indicated that they send more messages using WhatsApp Messenger compared to the SMS as they were not limited in terms of characters and content on WhatsApp Messenger. Participants in this study also perceived their WhatsApp Messenger conversations as natural and conversational in nature with the writing and receiving of messages that provided the sense of an open conversation, as if you were actually talking to a person.

Using WhatsApp Messenger afforded students the ability to send notes, voice notes, and pictures, enabling communication with their lecturers and clinical facilitators to clarify uncertainty. An added benefit is that it is cost-effective.

So if you, like, maybe if you do the examination and there's something you don't understand and you can send a picture and, like, text on WhatsApp to the facilitator.

(SFG 3; P 2)

Affordances identified (Bower, 2008)

The media affordances, including read-ability and write-ability by sending notes or text, view-ability and watch-ability by sending pictures, speak-ability and listen-ability by recording and sending a voice note, were identified as methods of communication.

Students decided on WhatsApp Messenger as the method of communication as it would enable them to send and receive text messages, pictures or voice notes.

It could be concluded that during the exploration phase of this study, students decided that WhatsApp Messenger offers the affordances that contributed to the introduction of m-learning into an undergraduate nursing programme to enhance ITCP using mobile devices.

Sub-theme: WhatsApp is best

Participants suggested that WhatsApp Messenger is a better social media application to use than Facebook, as Facebook's landing page sometimes takes time to open, thus slowing down real-time communication.

I am suggesting that WhatsApp is the best one, Facebook sometimes when you open its network, is slow. So, WhatsApp is very quick. (SFG 1; P 4)

Participants indicated that WhatsApp Messenger would be the mode of communication of choice to enhance the integration of the theory and clinical practice of the ENT health assessment in the PCCSM as it responds faster than other accessible social media applications.

Affordances identified (Bower, 2008)

The temporal affordance accessibility that allows for access to communication at anytime and anywhere was identified.

Real-time availability and accessibility would improve communication between the student and lecturer and clinical facilitator and thus make the distribution of multimedia messaging easier and faster, thereby benefiting the student in the learning process (Yeboah & Ewur, 2014).

It could be concluded that WhatsApp Messenger was identified as the application of choice to allow communication between students and lecturers and clinical facilitators.

Sub-theme: WhatsApp is cost friendly

WhatsApp Messenger was acknowledged as a “cost friendly” application by student participants in the study. One participant expanded on the cost effectiveness of WhatsApp Messenger and mentioned that even in situations where it is impossible to make a call or send a message using the SMS (due to low funds on the mobile device), the participant would, however, still be able to communicate via WhatsApp Messenger.

WhatsApp is really the best option, it is not costing that much. (SFG 1; P 2)

WhatsApp, because it's cheaper and everyone can access it. (SFG 3; P 5)

With WhatsApp, if you don't have airtime, if I have R2 on my phone I cannot make a call, I cannot send a SMS, but I can still WhatsApp. (SFG 4; P 1)

Affordances identified (Bower, 2008)

The navigation affordance link-ability that provides the capacity to link to other sections within the resource or other resources was identified as it supports the affordability of the social media application.

WhatsApp Messenger became very popular as the use of the application is free for the first-year and after that a small fee is paid to continue with the service, making it affordable and accessible (Yeboah & Ewur, 2014). In an investigation into the pedagogical suitability of using cell phones to enhance learning, Makoe (2012) finds that the use of social media applications such as WhatsApp Messenger allows lecturers to communicate with students and send information at an affordable cost.

WhatsApp Messenger appears to be the application of choice in education, with advantages over other technological tools used in education that include its low cost, simplicity, accessibility, efficiency and natural languages (Gon & Rawekar, 2017).

It could be concluded that WhatsApp Messenger would be a cheaper method of communication and this affordability makes it possible for students to link to or connect with their lecturers or clinical facilitators.

Sub-theme: WhatsApp is user-friendly

Participants perceived WhatsApp Messenger to be user-friendly and emphasised that, within a WhatsApp Messenger group, they would be able to see who is online, review discussions, and use the discussions for study purposes and access information from lecturers and clinical facilitators. Students would furthermore be able to search for information without having to leave their homes or clinical facilities on practical days.

Because you can see “whose” [sic] online. (SFG 2; P 4)

I think WhatsApp would be easy. If you want information from you, as our supervisor (clinical facilitator), it wouldn't take much time to get answers and for you to know what's going on in the facilities here. (SFG 3; P 3)

Because WhatsApp is easy to access. (SFG 3; P 1)

WhatsApp Messenger, a cross-platform mobile messaging application, allows people unlimited, quick access to information and the simplicity of how the system functions makes the program accessible to people of different ages and backgrounds (Bouhnik & Deshen, 2014). Currently, WhatsApp Messenger can be regarded as the cross-platform between the instant messaging application and mobile instant messaging (MIM) on smartphones (Church & de Oliveira, 2013).

The study participants of Church and de Oliveira (2013) indicated that they send more messages using WhatsApp Messenger compared to the SMS as they were not limited in term of characters and content on WhatsApp Messenger. Participants in this study also perceived their WhatsApp Messenger conversations as natural and conversational in nature, with the writing and receiving of messages providing a sense of an open conversation (as if you were actually talking to a person).

WhatsApp Messenger provided a simple communication method with unlimited use of words and characters while students were within clinical practice.

It could be concluded that WhatsApp Messenger was perceived as being user-friendly as you are able to see who is online, review discussions, and use the discussions for study purposes and access information from lecturers and clinical facilitators.

Sub-theme: WhatsApp allows instant responses

WhatsApp Messenger allowed immediate responses from lecturers and clinical facilitators to questions, ensuring a focused approach to the challenges experienced by students while in clinical practice. Students were encouraged to ask questions using WhatsApp Messenger while in clinical practice. Lecturers and clinical facilitators had the responsibility to respond immediately. Participants indicated that with WhatsApp Messenger, it was easy to get an immediate answer to a question, placing them in a position to manage a patient appropriately. One participant indicated that, because of the WhatsApp Messenger notification that shows on your screen, you were prompted to read and respond to messages received.

When I have some problem, immediately, I can contact you (lecturer and clinical facilitator) and then I need help to this part to explain to me. So immediately I can get your answer. (ISSI; P 3)

The findings of the study by Gachago, Strydom, Hanekom, Simons and Walters (2015) on the perspectives of lecturers on the use of WhatsApp Messenger to support teaching and learning indicated that the accessibility and immediacy of WhatsApp Messenger helped in facilitating the coordination of learning, clouding physical and geographical boundaries.

Affordances identified (Bower, 2008)

The temporal affordance accessibility allows immediate clarification and guidance using WhatsApp Messenger (Bower, 2008).

Mobile technologies have the capacity to provide undergraduate students with various educational affordances as they can render real-time information and thus assistance whenever and wherever needed (Lai, Yang, Chen, Ho & Chan, 2007).

It could be concluded that WhatsApp Messenger allows immediate responses to questions when a challenge is encountered while in clinical practice.

Sub-theme: Creating a WhatsApp Messenger group (WMG)

It was evident from the information received from students, supported by literature, that using the social media application WhatsApp Messenger would not only be affordable, but also accessible in situations when other social media applications would not be able to enhance

teaching and learning. The focus of the m-learning intervention using WhatsApp Messenger was to ensure the availability of lecturers and clinical facilitators to communicate with students; provide access to learning resources at any time and any place; and create a platform to share information. The administrators of the WhatsApp Messenger groups (WMGs) were advised of the implementation of the m-learning intervention.

Maybe you can post like messages on WhatsApp, we open a group. (SFG 1; P 4)

They can maybe create a group. (ISSI; P 1)

Affordances identified (Bower, 2008)

The access-control affordance share-ability allowed support through the creation of WMG that enabled one-on-one or one-to-many or many-to-many contributions and collaborations.

In a study by Bouhnik and Deshen (2014) on MIM between teachers and students, WhatsApp groups were established with the focus on participation in order to contribute to a positive atmosphere in the class setting. In the writings of Gachago *et al.* (2015) on the perspectives of lecturers on the use of WhatsApp to support learning, the lecturer primarily used the WhatsApp group to disseminate and engage with course-related content.

Establishing WMGs would thus contribute to engagement in communication and enhancement of ITCP. Bouhnik and Deshen (2014) state that it is possible to view WhatsApp as an enabler to students to co-operate and work as a team, thus providing peer assistance and support, an essential skill in the 21st century, which is not fully developed within a traditional class environment. The dialogue taking place between students, whether spontaneous or as guided by educators, creates an atmosphere of cooperation, solidarity and coming together to solve problems and deal with challenges.

It can be concluded that WMGs should be established to make communication easier and allow students access to information or communication wherever or whenever from their lecturers and clinical facilitators in real-time, without any time delay.

5.3.4 Theme 4: Email as a method of communication

Participants indicated that email is the best method of communication as they can keep documents in their email inbox rather than saving them on their mobile devices and using space. Participants emphasised that every student is familiar with how to use emails and, as a registered

student of the HEI, all of them should have and be able to access their email accounts. One of the participants echoed the other students who said that emails are the preferred method of communication and that they are more likely to use it than other methods of communication. In higher education, emails are widely accepted as the method of communication. Institutions use emails to communicate with members of faculty and important information is disseminated to students via email through the student data or source management system (Stephens, Houser & Cowan, 2009).

Sub-theme: Email is best

Participants indicated that email is the best method of communication as it enables them to keep documents in their email inbox rather than to save them on their mobile devices and take up space. Participants emphasised that every student is familiar with how to use emails and as a registered student of the HEI, all of them should have an email account and be able to access it.

We're using emails to get information. (SFG 3; P 4)

Everybody is familiar with emails. We all come to campus and check our emails. We use it. (SFG 2; P 2)

At least everybody has an email account; because they're all students here they have an email account. (ISSI; P 1)

In a study by Kirkup and Kirkwood (2005) on the use of different media platforms for tutoring activities in 2003 in higher education teaching, it was determined that 91% of tutors responded to student queries using email, while 40% used letters and 86% used a telephone.

The reliability of email, when Internet connectivity was available, as a tool or system that performs as it was intended to whenever required (Bower, 2008) was identified by students.

It could be concluded that every student and lecturer and clinical facilitator have an email account and have access to Internet connectivity to access emails that could be used to email large documents.

Sub-theme: Convenience of email

Participants in the study viewed email as a convenient method of communication as they are able to log on and out the system off-campus and because email attachments can accommodate larger documents.

And email specifically because it can accommodate larger documents that cannot be accommodated on WhatsApp. (SFG 1; P 4)

One participant advised the use of Gmail as it offered more “mailbox” space.

I would say rather send it to my Gmail account because I have bigger space there. (SFG 2; P 5)

The advantages of using email in student/instructor communication in teaching are that email provides an asynchronous communication. An email gives the instructor the opportunity to read and think about a useful response and it gives shy students and those reluctant to participate in class discussions and opportunity to think about the wording of their message before sending it (Hassini, 2006).

It could be concluded that the use of emails could be a convenient method of communication as it could accommodate the communication of larger documents.

5.3.5 Theme 5: Facebook as a method of communication

Facebook was also indicated as one of the preferred methods of communication but is not so popular as email and WhatsApp. One of the participants indicated that he/she has access to Facebook, but not to WhatsApp Messenger on his/her mobile device.

And also Facebook to me, I don't have access to WhatsApp, it's the other method of communication. (SFG 1; P 2)

A study by Wang, Woo, Quek, Yang and Liu (2012) explored the affordances of Facebook for teaching and learning and found that students mostly used groups to share information, negotiate ideas, coordinate collaboration and monitor progress. With its mission to make the world more open and connected Facebook had the highest number of visitors among all the social networking tools available in Web 2.0 in 2012, with approximately a billion active users

worldwide (Schroeder, 2012). People use Facebook to stay connected to friends and family, to ascertain what is going on in the world, and to share experiences and express what matters to family and friends (Bosch, 2009). Ivala and Gachago (2012) recommend that the daily use of technology by students in higher education could promote student engagement and communication and could lead to improved performance and retention of students.

It could be concluded that Facebook was considered as a preferred method of communication but was ranked below email and WhatsApp Messenger.

Sub-theme: Creating a Facebook group for communication

Participants indicated that Facebook is used more by students and one of the participants would more likely access Facebook communications than emails.

Because Facebook is a cross platform. Like I said, you are more likely to go onto Facebook than to check your emails. (SFG 4; P 2)

I also would like to support the Facebook opinion, because you don't need a lot to log onto Facebook. Even with your cell phone you can log on. (SFG 4; P 6)

The landscape of personal and professional communication has been changed due to technological advances in social media. Currently, social media platforms, including Facebook, have become an integral part of the daily existence of most users' lives thanks to the availability of smartphones that enable connectivity, communication and collaboration (Shahbar & Zincir-Heywood, 2017). The creative use of available technology can enable students to become more participatory in their learning process through knowledge construction rather than being spoon-fed information (Ivala & Gachago, 2012). Facebook has the capacity to create an open or public group or a private group to facilitate communication and discussion (Minocha, 2009).

Literature indicate that the creative use of Facebook, with its availability on smartphones to enable connectivity, communication and collaboration, could enable students to participate in their learning process through for example discussions in private Facebook groups. In this research study, the group that preferred Facebook for the communication of the m-learning intervention to integrate theory and clinical practice was, however, in the minority.

It could be concluded that there are students who have a preference for the use of Facebook as a mode of communication.

Sub-theme: Facebook not preferred for study purposes

One participant was very clear that WhatsApp and email are the most popular choices of communication, preferred to Facebook. The participant indicated that a Facebook profile may be viewed by friends and family members and the participant did not wish to have them access course-related communication and material.

I choose WhatsApp and email for that my explanation is, for me Facebook is a social network and I would not want the friends I have on Facebook to see my studies.

(SFG1; P 1)

A study by Wang *et al.* (2012) found that, although Facebook held various benefits to enhance teaching and learning, it was not a safe environment for teaching and learning. Students did not want their educators to be their friends on Facebook as they were concerned that educators could gain access to their personal Facebook profiles. Students also did not want their friends to have access to information regarding their academic performance in a course (Wang *et al.*, 2012).

It could be concluded that students do not want to use Facebook as a mode of communication because they do not want their family and friends to view their academic performance on their Facebook page.

Sub-theme: Privacy issues related to the use of Facebook

While some students were positive about the possibility of using Facebook, others were concerned about their privacy and the possibility of family gaining access to their profile and viewing their course-related work. Potential breach of privacy when using Facebook accounts, such as students visiting one another's private pages and gaining access to information of a personal nature because their identity would be known by everyone in the group, was also a concern. It therefore seems that they were not aware that there are settings on Facebook that ensures one's privacy. When loading photos or videos, one is furthermore guided to ensure that only those whom you allow have access to your posts and status updates (Rotter, 2015).

Unlike Facebook, you say your name, I say my name, the next time I want to know your

secrets I go to your Facebook wall, now I know your things that are not even concerning this project. (SFG 4; P 3)

The use of Facebook groups in a teaching and learning environment affords collaboration and social interaction, but the limitations include privacy matters, distraction and Facebook's lack of "distinction between entertainment and true intellectual engagement" (Wang *et al.*, 2012; Fewkes & McCabe, 2012).

Affordances identified (Bower, 2008)

The access-control affordance provides the capacity to allow or deny access to reading, editing, uploading, downloading, broadcasting, viewing and administering of information.

It could be concluded that students had mixed responses to using Facebook as a method of communication and permission would have to be obtained from students and lecturers and clinical facilitators to allow reading, editing, uploading, downloading, broadcasting, viewing and administering information received from them during the implementation of the study.

5.3.6 Theme 6: Email, WhatsApp Messenger and Facebook as methods of communication

Participants voiced that using email were their preferred method of communication, followed by WhatsApp Messenger, followed by Facebook. There were, however, students who identified WhatsApp Messenger as the method of communication mostly used by them. One participant selected email and Facebook as preferred methods of communication as both afford the ability to have a private conversation, while another preferred WhatsApp and email to Facebook.

Okay, I agree with what my fellow students have just said currently that emails is one of the major things that we use the most. (SFG 1; P 5)

WhatsApp is the most used under students at the moment. (SFG 1; P 1)

Email and Facebook for me, because Facebook you can go on inbox, a private conversation then you can communicate very well there and there would be nothing that will be seen by others and you can put a lot of information there. (SFG 1; P 2)

The role of social media has escalated and has increasingly gained momentum within today's e-society. Social media plays an essential role in collaboration, community building, participation

and sharing information. One of the important features of social media is that by using mobile and web-based technologies, highly interactive platforms that promote communication are created (Mbodila, Ndebele & Muhandji, 2014).

An authentic study by Bozalek, Ng'ambi, Wood, Herrington, Hardman and Amory (2014) revealed that the expansive affordances of WhatsApp Messenger improved the students' access to their educators, peers and the extended learning community through context-free access to resources related to curricular activities. It is clear that social media platforms play an important role in accessing and sharing information, which can extend the learning experiences of students.

Students were able to clarify among themselves that both WhatsApp Messenger and emails are to be used to communicate due to their accessibility and affordability. Facebook was indicated as one of the preferred methods of communication but was ranked below email and WhatsApp Messenger.

Affordances identified (Bower, 2008)

The affordances of WhatsApp would allow students and lecturers and clinical facilitators to have discussions in real-time and be able to share course-related information while within the clinical environment.

It could be concluded that after much deliberation, WhatsApp Messenger was decided upon as it offers real-time communication and most of the affordances for a mobile technology intervention, supported by email to communicate larger documents.

5.3.7 Theme 7: Maintaining professionalism within the clinical setting

Nursing is a practice where the nurse assists a patient in an attempt to contribute to the health or the recovery of the patient by performing unaided actions with the necessary strength, will and knowledge. This involves the provision of physical and emotional support to the sick, helpless and wounded (Freshwater & Maslin-Prothero, 2005; Harris, Nagy, & Vardaxis, 2014). The dictionary defines a role model as a person who serves as an example of the values, attitudes and behaviours associated with a role. Role models can also be persons who distinguish themselves in such a way that others admire and want to imitate them (dictionary.reference.com).

Sub-theme: The Registered Nurse as a role model

A participant remarked that they follow the example of registered nurses in clinical practice and essentially duplicate these actions as best practice. Students therefore look upon the registered nurses in clinical practice as their role models.

Because basically, the nurses are like our little videos that we watch, because this is what we literally do, we stare at them, they're holding it like that, so I must hold it like that. (SFG 2; P 5)

An integrative literature review by Baldwin, Mills, Birks and Budden (2014) illustrates the reality that nurses model professional behaviour to undergraduate nursing students in academia and within clinical practice. An effective role model should display professional qualities that include demonstrating enthusiasm about the nursing practice through teaching and learning. Research describes how nursing students learn from observing clinicians who build the professional skills and identity of these students (Baldwin *et al.*, 2013). Observation thus plays an important role in clinical teaching as students will adapt the skill that they have visualised.

Affordances identified (Bower, 2008)

The media affordances view-ability (images) and watch-ability (video) are emphasised by students. According to them, they follow nurses' example in clinical practice to enhance their learning process (Bower, 2008).

It could be concluded that registered nurses in clinical practice are to be provided with the students' clinical learning outcomes. Nurses should furthermore be informed that they should act in a professional and ethically correct manner as students observe them closely and acquire the clinical skills through observation.

Sub-theme: Nurses don't have time to explain

Participants claimed that one of the challenges they experienced in clinical facilities were that the registered nurses were too busy and did not seem to have time to teach and respond to questions from students. Participants acknowledged that this was because the facilities were busy and thus the registered nurses were busy too.

Sometimes you can't ask the sisters (registered nurses), because they're busy working.

They don't have time to explain to you. (ISSI; P 3)

Yesterday, I worked in this facility, and I asked the sister but up till today, she didn't give me an answer, because they're so busy. (ISSI; P 4)

Participants did, however, feel more comfortable to direct their questioning to their clinical facilitators rather than to the registered nurse in the facility.

You feel more comfortable to ask your facilitator, your facilitator knows you, knows where you're coming from. What you're lacking and what your good points are.

(ISSI; P 5)

Msiska, Smith and Fawcett (2014) conducted a study on the “life world” of Malawian undergraduate student nurses and discussed the problems and challenges experienced by undergraduate nursing students during their clinical placements. One of the findings portrayed was failure to fulfil the clinical teaching role and the dismissive attitudes some nurses displayed towards the students, which hindered student learning. There is thus a need for an intervention in which both the educational institutions and healthcare facilities adopt a passion-centred philosophy of clinical teaching and collaborate with clinical personnel who play a pivotal role in the creation of positive clinical learning environments.

It could be concluded that students experienced that registered nurses were not always available to guide them due to their workload, but they were comfortable to direct their questions to their clinical facilitator.

Sub-theme: Impact of the use of mobile device in clinical practice on professionalism

Participants were concerned that the use of mobile devices in the clinical environment might seem unprofessional. The participants deemed it important to rather excuse themselves and leave the patient in the care of another healthcare provider to go to a private area to seek answers or guidance from the clinical facilitator by using a mobile device.

What about the professionalism? If you're “WhatsApping” during the time of work, I think it would also affect the professionalism of nursing. (SFG 3; P 4)

A participant in a study by Russel, Gentsler and Wood (2014) experienced difficulty in changing the practice of traditional record keeping to using mobile technology for this purpose. Some nurses found it difficult to use a mobile device while on duty, as they thought it might seem unprofessional. As identified by literature, there may be challenges with using mobile devices while in clinical practice. As mentioned above by the student, they can excuse themselves from the consultation room (leaving the patient in the care of the registered nurse) while they ask the clinical facilitators for guidance or clarification.

I think it would help in a case where you need answers now. Then you excuse yourself then at least you leave that person with someone else to help. (SFG 3; P 4)

Mather, Gale and Cummings (2017) guide that the use of mobile technology should be implemented appropriately, used effectively and risks associated with using mobile technology within healthcare settings minimised. This will ensure that standards and guidelines reflect an unbiased approach to improving the risks while the benefits of mobile technology are promoted.

It could be concluded that maintaining professionalism while using mobile devices within clinical facilities would have to be ensured.

5.3.8 Theme 8: Teaching and learning methodology

The case-based reasoning is a recurring and integrated process of solving a problem and learning from this experience is the solving of a new problem (Aamodt & Plaza, 1994).

Sub-theme: Case-based methodology

Participants were comfortable with the case-based methodology, one of the teaching methodologies followed in a school of nursing at the HEI where the study was being conducted. Case-based reasoning or case-based learning is learning from a problem case that has been created from a previous experience and can be used to manage similar problems in the future. Students were comfortable with this methodology and using “prepared” cases as they have been exposed to the case-base methodology from their first-year of study.

First of all, we started with the case base from first-year. This is now my third-year, which means I'm very comfortable with the case-based studies. (ISSI; P 4)

I really enjoyed the case-base methodology because I feel that there's uniformity in it.

(ISSI; P 2)

A new case or a case that has been unsolved is the description of a new problem to be solved (Aamodt, 1994).

Affordances identified (Bower, 2008)

The access-control affordance share-ability that allows support on a basis of one-on-one or one-to-many or many-to-many may support the notion of uniformity while using the case-based methodology (Bower, 2008).

It could be concluded that, to ensure uniformity, lecturers and clinical facilitators have to ensure that all students have access to the “same amount of information” to work with during the intervention using the case-base methodology.

Sub-theme: Paper case versus actual case

Participants indicated that both a prepared case or case study and an actual case (managed within in the clinical facility) could be beneficial to their learning.

When you are given a case scenario and you then have to work on that case, sometimes I can say in a way it does limit a student’s capability to go and investigate more.

(ISSI; P 7)

When we deal with the real patient, that way you see the real feelings of a patient and it is so different from the module patient or from the book. (ISSI; P 8)

Case-based learning (CBL) is an established pedagogical teaching and learning method that can be defined in numerous ways, depending on the discipline and type of case being used. Within the health profession, learning activities are commonly based on patient cases. Students’ learning is associated with real-life situations where the basic, social and clinical sciences are studied in relation to the patient’s case that is integrated with clinical presentations and conditions (Thistlethwaite, Davies, Ekeocha, Kidd, MacDougall, Matthews, Purkis & Clay, 2012).

It could be concluded that learning can take place from both a prepared case or case study and an actual case managed within in the clinical facility.

Sub-theme: Interactive case discussion

The participant emphasised that she is a “visual person” who would appreciate challenging and engaging interactive sessions.

I'm a visual person and I'd like to see things practically. When I'm in class, I always participate. I always listen when I'm in class because I hate going home and study and looking at all these words. I like interactive stuff. (ISSI; P 2)

In a study to determine students' perspective on undergraduate radiology teaching, third- and fifth-year students identified that the most effective form of teaching in their view was through interactive case-based discussions (Nyhsen, Steinberg & O'Connell, 2013).

Good teaching and learning are supposed to be interactive and practical, as guided by Chickering and Gamson (1987) in their principles on good practice in undergraduate education. Teaching should encourage contact between students and a faculty, develop reciprocity and cooperation among students, encourage active learning, give prompt feedback, emphasise time on task, communicate high expectations, and respect diverse talents and ways of learning.

It can be concluded that the need for interactive learning opportunities has been identified.

5.3.9 Theme 9: Setting personal boundaries

Facebook and WhatsApp Messenger leveraged learner participation and transformed pedagogy at the Open University of Indonesia. Lecturers with families, however, expressed ambivalence about Facebook and WhatsApp Messenger as having to respond to students anytime and anywhere interferes with family commitments after hours (Susilo, 2014).

Sub-theme: Access after hours

Participants had mixed responses about the personal boundaries of lecturers and clinical facilitators on the WhatsApp Messenger group. One participant felt that it would be overstepping boundaries to have the cell (mobile) phone number of a lecturer as it is viewed that students and lecturers “don't communicate often via WhatsApp Messenger or BBM or whatever”. This will also have an impact on students sending a text message outside of the time arranged for communication and discussion.

But I feel if I were to communicate with a lecturer on WhatsApp, I would feel that I was

overstepping a personal boundary. (SFG 4; P 2)

Bouhnik and Deshen (2014) dealt with WhatsApp Messenger in schools and concluded that when teachers are part of a group, irrespective of whether they were dominant or quiet listeners, the students were aware of their presence and behaved respectful in terms of the writing style, the way they treated one another, and the way they expressed themselves in relation to the content learned.

Affordances identified (Bower, 2008)

The above findings therefore confirm the assumption that affordance accessibility allows communication at anytime and anywhere, while the personal boundaries of the lecturer and clinical facilitator are respected (Bower, 2008).

Students and lecturers and clinical facilitators could gain confidence in those aspects of teaching and learning within an online presence, allowing them to feel comfortable and relaxed, thus affording communication and interaction while engaging with a variety of tools within the allocated time frames (Dahlstrom, 2014).

It can be concluded that there will have to be set time frames for communication between students and their lecturers and clinical facilitators to ensure that students respect their personal off-duty time.

Sub-theme: Peer learning support via mobile devices

A research study using a quasi-experimental design included an intervention and comparison group with baseline and follow-up assessment. The study was conducted over a four-week clinical practice education allocation. During the final two weeks the intervention group engaged in peer learning while continuing with traditional supervision with the comparison group. The results of the study indicated that that peer learning had an impact on the nursing students' self-efficacy to a greater degree than with traditional supervision (Pålsson, Mårtensson, Swenne, Ädel & Engström, 2017).

The participants stated that the off-duty time of the lecturer has to be respected and that students can use one another as resources within the group. Cheung, Chiu and Lee (2011) found that students, especially female students, were inherently motivated to feel connected to others within a virtual environment.

Because I know some of the lecturers are still studying as well. So we can't impose on their lives. So let's use each other as a resource. (SFG 2; P 5)

Creating a virtual community of students would therefore possibly promote the purpose of these students to use an online learning technology. Cheung and Lee (2011) found that attitudes of female students about the use of online learning technology had a strong, direct effect on their behavioural intention to use an Internet-based learning medium.

It can be concluded that students will consult fellow students, the more knowledgeable other (MKO), a resource, within the WhatsApp Messenger group after hours.

5.3.10 Theme 10: Other methods of communication

Sub-theme: SMS as a method of communication

One participant advised that the SMS should be used as a method of communication, but this participant also identified the challenges that the use of SMSs could create, i.e. the costs that might be incurred by the students and educators (Idrus & Ismail, 2010).

I really do think that generally the SMS is a very good idea. It's simple. It's very basic.

You can open our SMS, read it and that is it. (SFG 4; P 2)

Since its inception 20 years ago, SMSs revolutionised the way we communicate. Using a SMS formed part of a mass communication medium used by billions of people around the globe, and in 2011, 7.8 trillion SMS messages were sent worldwide (Church & Oliveira, 2013).

It could be concluded that SMSs will not be suitable for a m-learning intervention due to the associated cost, which negatively impacts affordability.

Sub-theme: Mxit as a fallen trend

Participants made it very clear that Mxit is a fallen trend among university students, but the application is still being used by high school children. As Mxit is an application that you have to download; the participant felt that it was a waste of megabytes, and rather than losing data, they would rather access WhatsApp Messenger, Facebook or email. In 2011 Mxit peaked at 42 million users globally, but only 2.7 million monthly active users were confirmed in South Africa by the end of 2014. In 2015 Mxit had plunged to just 1.2 million monthly active users South Africa (Alfreds, 2015).

I do use Mxit, but most people don't use it. (SFG 1; P 3)

Why would you download a message ... that none of your friends or colleagues is using? What is the point of that? (SFG 1; P 1)

Mxit is a mobile phone instant messaging application which is a proprietary software package of MxitLifestyle (Pty) Ltd, based in Stellenbosch, South Africa. Mxit enables easy communication between people via text messages similar to SMSs on mobile phones. The primary difference between a SMS and Mxit is the associated cost, as messages sent via Mxit cost approximately one or two cents, whereas SMSs could cost more than fifty cents (depending on type of contract). This cost effectiveness of Mxit makes it very popular among the teenage population within South Africa (Butgereit, 2007).

It could be concluded that Mxit will not be suitable for a m-learning intervention as students viewed Mxit to be associated with school learners and it was furthermore not cost-effective to download the application.

5.4 FINDINGS: LECTURERS AND CLINICAL FACILITATORS

The lecturers and clinical facilitators' verbatim transcriptions of the focus group, ISSIs and conceptualisation group were collectively analysed and five main themes and a number of sub-themes were identified, as illustrated in Table 5.3.

Table 5.3: Themes and sub-themes (lecturers and clinical facilitators)

Themes	Sub-themes
Affordances of mobile devices enhances teaching and learning	Mobile devices as a positive learning resource Mobile devices: affording access to communication Mobile devices: affording peer learning
Preferred methods of open dialogue/communication with students	WhatsApp Messenger as a method of communication Email as a method of communication Facebook as a method of communication WhatsApp Messenger, email and Facebook as methods of communication Learning Management System (Sakai) as a method of communication

Concerns regarding an implementation using mobile devices	Student need for practical guidance The need for Internet facilities
Maintaining professionalism within clinical settings	Ethical concerns regarding the use of mobile devices in facilities
Structuring a m-learning intervention	Case-based teaching methodology Planning and implementing practical case studies Use of real case studies managed in clinical facilities
Managing/guiding groups to ensure direction and cohesion	Assigning conditions per group Assigning small groups to lectures and clinical facilitators to promote effective communication Sharing discussions once a week

5.4.1 Theme 1: Affordances of mobile devices enhances teaching and learning

Salomon (1993), as cited in Conole and Dyke (2004), refers to ‘affordances’ as the perceived and actual properties of an object, primarily the functional properties, that determine just what and how the object could possibly be used. Gibson (1979) and Bower (2008) provide the following definition of affordances: “The affordances of the environment are what it offers the animal, what it provides or furnishes, either for good or ill. The verb to afford is found in the dictionary, but the noun affordance is not. I have made it up. I mean by it something that refers to both the environment and the animal in a way that no existing term does. It implies the complementarity of the animal and the environment.”

Bower (2008) matches teaching and learning tasks with appropriate learning technologies by looking at the action potential of the technology. The dynamic model of Bower (2008) enables a better understanding of how teachers identify different kinds of knowledge as valuable in an attempt to support students’ ability to learn content knowledge. The categories of affordances of mobile technology provided a framework for the data analysis in this exploration of the affordances of mobile devices in integrating theory and clinical practice in an undergraduate nursing programme, as illustrated in the data analysis of the students and of the lecturers and clinical facilitators to follow.

Sub-theme: Mobile devices as a positive learning resource

Responses from lecturers and clinical facilitators confirmed that students had advanced knowledge of technology and that this knowledge could be used positively to assist them in their learning process. Lecturers and clinical facilitators also had the responsibility to embrace and adapt to new technology.

I personally think that using a mobile device for teaching and learning is something very positive, because the students that we have today are students who are more technologically inclined. (ISSI; P 1)

So technology is changing all the time. So we need to adapt as a school and as educators, we need to adapt to technology. (ISSI; P 2)

There has been an increase in the use of mobile technology to enhance teaching and learning practices (Sharples *et al.*, 2012; Rambe & Bere, 2013). M-learning has become a new trend in the education sector, with an exponential acceleration in the variety of applications afforded by mobile devices (Aharony, 2014; Gupta & Koo, 2010). Communication technology is continually transformed, with the appearance of new applications and innovations on a daily basis. Emerging technologies are paving the way for global networks and communities of interest to develop new forms of communication outside the realms of formal education. Communication and interaction with other learners and educators within an online presence using multisensory Web 2.0 tools offer a flexible way of being available “if and when required” (Aharony, 2014; Gupta & Koo, 2010).

It can be concluded that the initial response to the introduction of a m-learning initiative to enhance teaching and learning was very positive. Lecturers and clinical facilitators identified that mobile devices could be used to encourage learning.

Mobile devices were also referred to as a learning resource to students in the absence of their lecturer or clinical facilitator.

Because your mobile is just like a further resource or even a help, if you can say it like that, an educator in the absence of us. (ISSI; P 3).

In a study by Ramos (2008) that deals with the use of mobile devices for learning, students expressed their excitement about m-learning interventions. M-learning and Internet access allow educators to have an 'open door policy' to learning, enabling them to apply their teaching practices at any time zone and any place (Ally, 2009).

It could be concluded that mobile devices could be used as a resource to allow lecturers and clinical facilitators to have an open-door policy.

Sub-theme: Mobile devices: affording access to communication

Mobile devices' provision of access to communication to enhance teaching and learning was positively viewed. Lecturers and clinical facilitators identified that almost everyone has a mobile device and that its size makes it very portable and user-friendly.

All the students have mobile devices, cell phones where they can access. (CDG; P 4)

I was thinking this thing is small. Everybody is walking around with a mobile device and by putting all the content or making it accessible for them there should they come across. (LCFG; P 3)

Handheld technological devices or PDAs (personal digital assistants) were effectively incorporated into nursing education programmes and provided students with a rich resource of reference material that was available and up to date. Almost 80 percent of students who participated in this study indicated that they successfully used PDAs as an educational resource in both the classroom and the clinical environment (George *et al.*, 2010).

A study that reviewed the perspectives of students on learning with cell phones, smartphones and social media indicated that students thought that mobile devices facilitated interaction with the course material and other students within a highly situated and contextualised manner (Gikas & Grant, 2013). Kukulska-Hulme (2010) reports on the efficient use of mobile technology in learning and communication by a wide range of students in diverse settings.

It could be concluded that mobile devices could provide access to communication between students and lecturers and clinical facilitators as almost everyone has a mobile device and it is very portable due to its size.

Sub-theme: Mobile devices: affording peer learning

Lecturers and clinical facilitators identified that the student groups could facilitate peer group discussions with their mobile device, which could create a sense of correlative learning.

If we set up groups then they can actually advise one another. Sometimes they are more comfortable to speaking to a fellow student. (LCFG; P 3)

Yes, because when they discuss what they've experienced then they learn from each other. (LCFG; P 2)

The American Association of Colleges of Nursing, the National League for Nursing and the Institute of Medicine, major forces in professional health care and nursing education, advocate the incorporation of mobile devices into nursing education for ITCP (George *et al.*, 2010).

It could be concluded that mobile devices could be used to facilitate peer learning.

5.4.2 Theme 2: Preferred methods of open dialogue/communication with students

Sub-theme: WhatsApp Messenger as a method of communication

WhatsApp Messenger was suggested as a mode of communication as one of the participants indicated that WhatsApp Messenger was already used to communicate with students while in clinical practice and suggested the use of email communication as well. One participant remarked that some students might not have access to the Internet and would therefore not be able to access WhatsApp Messenger. Students would be encouraged to ask questions using WhatsApp, supported by emails, after the completion of every section of their module content. It was stated that WhatsApp could be used for diagnosis and management. Students could communicate the signs and symptoms observed in a patient within the clinical facility to the lecturer or clinical facilitator, who can then provide guidance with the correct nursing diagnosis and management. According to participants, the theory and clinical practice could be integrated in this way.

With the WhatsApp we can communicate about our content. (ISSI; P 1)

WhatsApp, the application and that we, as lecturers and clinical facilitators, we need to come on board with the students. So that we can communicate with our students to

facilitate and to encourage student learning. (CDG; P 4)

During the last decade, digital communication among students and between students and teachers has become popular through various channels e.g. email, SMS, Facebook groups, Twitter and now WhatsApp Messenger. Each one of these channels has individual characteristics that have an influence on its suitability for teaching and learning purposes (Calvo, Arbiol & Iglesias, 2014). WhatsApp Messenger could enhance communication between students and lecturers and clinical facilitators.

It could be concluded that WhatsApp Messenger would be an appropriate application to use for a m-learning intervention.

Sub-theme: Email as a method of communication

Lecturers and clinical facilitators discussed the use of email as a method of communication and agreed that it could be used to communicate larger documents.

On email we can always put attachments on the email or short videos or slides about physiology. (ISSI; P 1)

I think we can also use email as a platform to send bigger documents as a means of communication. (CDG; P 3)

Email has become a mode of communication of many due to its ubiquitous nature, relative low cost, global reach, speed and flexibility. Email thus leans towards being a promising instructional and learning tool, even though its strength as an educational tool relies solely on the construction of a solid email-based environment and a pedagogically sound message (Huett, 2004).

It could be concluded that emails would be appropriate for disseminating videos and larger documents during a m-learning intervention.

Sub-theme: Facebook as communication method

One of the participants shared an experience of a student who was his or her Facebook friend. The student posted on Facebook about her excitement about being able to visualise the tympanic membrane for the first time.

That was an opportunity whereby we could've, test her knowledge, but to expand. But what did you see about the tympanic membrane? How did it look? At the same time, her other friends, her colleagues could have learnt from that opportunity. (LCFG; P 4)

Social network sites (SNSs) have become an integral part of the daily routine of students' lives. A survey of 283 college students in the United States (Munos & Towner, 2011) found that students primarily use their SNSs for informal learning purposes, which involved peer interactions about non-required course content. A study by Jones, Scanlon and Clough (2013) found that 30.4% of university students reported that they were indeed using SNSs for course-related conversations.

Although a small sample size was used (n=42), students in a UK case study claimed that if they had a single choice, they would prefer to use email for communication between teachers and students and between peers. Most students were, however, active Facebook users (79%) and were open to the idea of using Facebook for academic communication (Vivian, Barnes, Geer & Wood, 2014).

It could be concluded that Facebook could have been used as a platform to share experiences, but as indicated before, it was ranked below WhatsApp Messenger.

Sub-theme: WhatsApp Messenger, email and Facebook as methods of communication

Initially, participants did not agree on the most suitable method or methods of communication for enhancing ITCP for students. But in the end, lecturers and clinical facilitators indicated that email, followed by WhatsApp Messenger, followed by Facebook, should be used. Students ranked them in the same way. Lecturers and clinical facilitators advised that emails should be used as a communication platform to disseminate videos and larger documents to students. The lecturers and clinical facilitators identified that WhatsApp Messenger can be used as a learning platform, but that students have to ensure that they bring all prior knowledge to the platform. Students can be prompted with a picture or case-based scenario on the WhatsApp Messenger group to assist them with self-directed learning and revision. Students, especially those who are scared or shy to ask questions in class, can even use the platform to obtain clarity on issues discussed in class. One lecturer and clinical facilitator, however, remarked that a limitation of using WhatsApp Messenger is that an Internet connection is needed.

I use WhatsApp. We can use email. And with the WhatsApp, we can communicate about our content. (ISSI; P 1)

So they can send in their queries or anything that they find in the clinic... and you can have a discussion over WhatsApp. (LCFG; P 2)

They can communicate to us via for example, emails or the WhatsApp or whatever they prefer and we can answer them accordingly. (CDG; P 1)

Global ownership of mobile devices, integrated with the affordances of social media networks, provide a resource-rich platform for innovative students' directed learning experiences (Cochrane, Antonczak, Keegan & Narayan, 2014).

Lecturers and clinical facilitators indicated that they were open to an intervention to integrate theory and clinical practice using WhatsApp Messenger, supported by email, as a mode of communication with students.

It could be concluded that WhatsApp Messenger is the preferred mode of communication, supported by email for larger documents.

Sub-theme: Learning Management System (Sakai) as a method of communication

Lecturers and clinical facilitators discussed how the learning management systems of the HEI, iKamva, the Sakai platform, could be best used as “a bigger application” to enhance the teaching and learning experiences.

We need a bigger application whereby we can use it to introduce this method to the student, because it will be easier, it will be workable. (LCFG; P 4)

We can use iKamva. We can use Groupwise and share our experiences with each other and even students, because, remember, students also have access to the information that the supervisor have – the discussions within the group. (CDG; P 2)

Because we are going to put our lecture notes and all of those on there (LMS). So they can always just go back and use it as a reference. (ISSI; P 3)

The premise of Sakai as a learning management system (LMS) is to enhance teaching, learning, collaboration and research. Sakai was developed with the intention of providing a robust, free and truly community-driven alternative to proprietary learning systems. An open source

software suite developed by its adopter community, the Sakai project continually evolves in step with the needs of the students, educators and organisations it serves. Colleges, universities, governments and other organisations make use of Sakai's rich toolset to expand the possibilities for technology-enabled learning across many aspects of the educational experiences envisaged (www.sakaiproject.org).

Affordances identified (Bower, 2008)

The access-control affordance share-ability in “a bigger application” that allows “access to the information” that is offered by the Sakai platform, iKamva, of the HEI was identified by the lecturers and clinical facilitators.

A study by Dube and Scott (2014) on the use of the Sakai LMS in Zimbabwe conclude that the Sakai LMS was an essential learning platform as it offered access to technical support and facilitated communication and interaction between the lecturer and students, thus enabling immediate assessment and subsequent feedback.

It could be concluded that the LMS of the HEI offered on the Sakai platform, iKamva, could be actively used to share discussions and documents.

5.4.3 Theme 3: Concerns regarding an implementation using mobile devices

Sub-theme: Students' need for practical guidance

It was emphasised by the lecturers and clinical facilitators that students needed guidance while in clinical practice. Learning while within the clinical placement environment requires the environment to be conducive to learning and there should be appropriate support from skilled practitioners and lecturers and clinical facilitators to assist students.

Our students do still need guidance. (CDG; P 1)

I know it's very rare that we won't find a registered nurse with a student ... but they do need assistance. (LCFG; P 4)

A clinical setting rich in learning experiences, but lacking in support, discourages students to seek experiences that will ensure that they meet their learning outcomes and result in the loss of learning and growth opportunities (Mabuda *et al.*, 2008). Effective learning depends on the abilities of educators to encourage and support collaborative learning (Makoe, 2012).

The clinical learning experience is an essential component of learning within nursing practice as it enables the students to integrate their theoretical and conceptual knowledge (Ironsides, McNelis & Enright, 2014; Murphy, Rosser, Bevan, Warner & Jordan, 2012). Mabuda, Potgieter and Alberts (2008) describe clinical teaching as the manner in which the student nurse learns to apply the theory of nursing, integrating theoretical knowledge and practical or clinical skills within the clinical setting, which becomes the art and science of nursing.

Clinical teaching outcomes are guided by the minimum requirements and guidelines of the South African Nursing Council (SANC, 1992) who relates to clinical learning as follows: “the overall objective of clinical practice is to provide student nurses with meaningful learning opportunities in every area of placement according to the level of training, to ensure that on completion of the programme the student nurse is able to nurse efficiently.” This would imply that student nurses should be able to demonstrate the ability to solve problems effectively and apply a scientific approach to nursing from the initial assessment to the rehabilitation of the patient or client (Mabuda *et al.*, 2008).

It could be concluded that affordability and accessibility to m-learning could afford lecturers and clinical facilitators with a platform to encourage and support collaborative student learning.

Sub-theme: The need for Internet facilities

A concern was raised by lecturers and clinical facilitators about the implementation of a learning intervention using mobile devices in clinical facilities, namely the need for reliable Internet access at such facilities. The necessity of Internet access might present a challenge to the implementation of the learning intervention, since it seemed that there were participants who did not have Internet access at clinical facilities.

No, currently we haven't got access to Internet, but if the students have access to [the] Internet and I have access to [the] Internet, then we can use this as an advantage for ourselves. But at the moment, we haven't got Internet. (ISSI; P 1)

The Internet has become a very important feature in the age of information technology. The use of computers and the Internet have become essential parts of the daily lives of the individual (Tutkun, 2011). Access to and the sharing of knowledge “via the Internet and other

communication technologies lies in the interest of the educated, primarily those in the university level; those with the power for social change and development.”

Students at university level have an obligation to be open to being equipped with qualified cognitive, affective and psychomotor proficiency during their studies. The “production” of knowledge and “turning this knowledge into technology to facilitate an increasing quality of life and the students’ ability to access and use this knowledge purposefully while sharing it at a high level is a requirement of the information era” (Tutkun, 2011).

Edoho and Bassey (2014) researched school-based computer and Internet training needs of primary school teachers in Akwa Ibom State of Nigeria and concluded that there exists a significant relationship between the availability of Internet facilities in schools and the effective utilisation of the facilities by teachers. The inclusion criteria have to focus on participants who have access to the Internet to ensure a significant interactive implementation of this research study.

Affordances identified (Bower, 2008)

The navigation affordance browse-ability, link-ability and search-ability would be important as it would provide the ability to search for information using the Internet. This also leads to a technical affordance as there would be a need to be able to adapt to the bandwidth of the connection, and to the speed and the efficiency of the device.

It could be concluded that students and lecturers and clinical facilitators will have to meet the inclusion criteria to be part of the study and participation includes having access to a reliable Internet connection off-campus.

5.4.4 Theme 4: Maintaining professionalism within clinical settings

The professional image of health care institutions, HCPs and students could be negatively affected by the posting of unprofessional content on social media networks. Information featured on a social media profile, such as photos, nicknames, posts, and comments liked or shared, as well as the friends, causes, organisations, games, and media that a person follows may impact how the professional image of the individual is perceived. Unprofessional behaviour would include the violation of a patient’s privacy; using vulgar or discriminatory language; images of sexual suggestiveness or intoxication; negative comments about patients, an employer,

or a university; taking photographs of patients during surgery; posing with weapons or alcohol; posting “tweets” that are harmful to an individual or the profession; and airing frustrations or “venting” (Ventola, 2014).

Sub-theme: Ethical concerns regarding the use of mobile devices in facilities

The lecturers and clinical facilitators remarked that ethical concerns may arise from the use of mobile devices within clinical facilities, e.g. when students take pictures of patients, which could breach confidentiality of patient records. Cognisance has to be taken of the mobile (cell) phone policy of facilities and formal permission has to be obtained before any information of the patient may be included in any study.

My concern is now, what about ethics? The ethical side of it? Is it allowed for our students to use actual patients to present? Is there any ethical issues attached to that?

(CDG; P 1)

I think ethical issues will come in where the students have to take pictures of the patients. So when it comes to pictures, I think the ethical clearance needs to get from the administration of the facility. (CDG; P 3)

I'd just like to caution the group with regard to the cell phone policies. So we need to find out about the institution's cell phone policy before we can continue. (CDG; P 1)

I think prior to the commencement of the interview with the patient, you need to obtain informed consent any way from the patient in order to do your procedure. So you might as well obtain consent from the patient to use your cell phone and then explain the purposes of the cell phone. (CDG; P 3)

Permission was obtained from the Department of Health in the WCP (Annexure 5 & Annexure 6) to conduct this study at two Provincial Community Health Centres. Students and lecturers and clinical facilitators placed at these two clinical facilities to assist students to attain their clinical learning outcomes were permitted to use their mobile devices to communicate and take pictures of clients with their written consent to enhance ITCP. Students, however, did not include pictures or videos of patients, but they simulated activities related to conditions that patients presented with.

It could be concluded that cognisance has to be taken of the mobile (cell) phone policy of clinical facilities and the importance of obtaining of permission to conduct the study at clinical facilities.

5.4.5 Theme 5: Structuring a m-learning intervention

Sub-theme: Case-based teaching methodology

In the current PCCSM, lecturers are using the case-based methodology as one of the teaching philosophies at a school of nursing where the study was conducted. In the one ISSI, a lecturer and clinical facilitator suggested that students should be given the opportunity to compile a case managed at their clinical facility. Reliable “real-life images” could be obtained to support their case. Guidance will be provided using mobile devices during the gathering of data and writing up of the case for presentation to the class. This will give them an opportunity to experience how the content fit into the actual practice, thus ITCP.

*If you look at the philosophy, the teaching philosophy of the school, which is case-based.
(ISSI; P 2)*

Agbor-Baiyee (2009) described the case-based methodology as an innovative pedagogy with five primary critical thinking characteristics, which include: 1) it is problem based; 2) it is student-centred; 3) it is reiterative; 4) it makes use of small groups; and 5) it facilitates and promotes learning strategies through the use of situation-specific cases.

A study by Nkosi, Pillay and Nokes (2013) on implementing case-based teaching strategies in a decentralised nursing management programme in South Africa found that the facilitators battled with CBL as they had large groups of students, while Lillis, Gibbons and Lawrenson (2010) indicate that small groups of six to eight students who sit face-to-face in the classroom were more effective.

It could be concluded that students should be given an opportunity to compile a case managed at their clinical facility and “real-life images” could be ethically obtained to support their case.

Sub-theme: Planning and implementing of practical case studies

In the PCCSM, there is a focus on certain common conditions that are managed at a primary level of care, as referred to by participants during the conceptualisation group. It was advised

that the focus would remain on the outcomes that the students have to attain. Students would be expected to identify a common condition based on signs and symptoms presented by a patient.

We are going to identify the conditions and then the student will have to look for those conditions in the facilities. (CDG; P 1)

I would like to add, I know now this is moving, but it's actually not moving away from the case-base method if you teach your study according to the complaint that the patient is presenting with, signs and symptoms presented with, make a diagnosis. (CDG; P 4)

Clinical practice is fundamental in nursing education – a practice-based discipline. Clinical practice affords student nurses with the opportunity to develop confidence and competence. The focus is on the learning needs of the students and not on the services needed by the health facility. Developing a suitable learning environment where theory and clinical practice complement each other is important to ensure the intended learning outcomes of the students during the clinical learning period. Collaboration between clinical staff and nurse educators is important in the facilitation of students' learning experience and acquisition of clinical skills (Croxon & Maginnis, 2009; Löfmark, Thorkildsen, Råholm & Natvig, 2012; Phuma-Ngaiyaye, Bvumbwe & Chipeta, 2017).

When commencing with the module, students are advised to utilise their knowledge acquired in the medical/surgical and medical biosciences modules offered during the first and second-year of their studies. Knowledge of these modules is required to assist them with the health assessment of the patient, which includes the following components:

- History taking of the patient
- Performing a physical examination
- Respond to the patients' needs
- Evaluate the effects of nursing care rendered

Students are encouraged to develop an enquiring mind, to use every opportunity to increase their knowledge, competence and skills in the skills laboratory and within the clinical facilities. The 2016 CUR 312 PCCSM descriptor (Annexure 23) states that the main outcomes a student should attain at a primary level of care are to:

- Demonstrate an understanding of conducting a history taking, specific to certain systems of the body
- Demonstrate an understanding of the techniques involved in conducting a physical assessment
- Demonstrate the ability to identify the difference between normal and abnormal conditions
- Demonstrate an understanding of the management objectives for common conditions
- Display a basic understanding of the anti-retroviral treatment protocols

It could be concluded that the PCCSM focuses on certain common condition that are managed at a primary level of care and students are expected to identify a condition based on signs and symptoms presented.

Sub-theme: Use of actual case studies managed in clinical facilities

Lecturers and clinical facilitators identified that prepared case scenarios were used in the current course guide, but they advised that the students should prepare an actual case study of a patient managed within the clinical facility, including the presentation of the complaint, examination, diagnosis and management.

Students can use real scenarios in the clinical facilities, I mean, like patients that they've treated, they come with a scenario. (CDG; P 1)

We can use the patient as a case study, because the patient is a case study and that information we get from the patient, can be used to advance all the students. (ISSI; P 1)

So we will give them an example of how you are supposed to formulate a case study in the class. (CDG; P 4)

CBL should be centred around and focused on the students and not the educator (Le Roux & Khanyile, 2012). Loghmani, Bayliss, Strunk and Altenburger (2011) report on the appreciation of interactive case-based training by teachers and students in nursing, midwifery, physical therapy, paramedics, etc. where the use of cases had the potential for improved modelling of real cases in clinical practice. The enhanced extraction of relevant information by students proved to be a time-saver for the faculty.

It could be concluded that students should be granted an opportunity to summarise and present an actual case managed in the facility to the class; however, an example should be provided on how to formulate a case study.

5.4.6 Theme 6: Managing/guiding groups to ensure direction and cohesion

Sub-theme: Assigning conditions per group to ensure optimal learning

Participants discussed how, for example, it can be assured that the individual groups placed at the clinical facilities were exposed to all the conditions related to the ear. The clinical facilitator to whom the students were assigned to would have the responsibility to provide guidance on the condition they have to focus on.

So the ear rotates between the groups, but every time they need to come up with a different condition with regard to the ear. (CDG; P 3)

The supervisor (clinical facilitator) guides the student during clinical supervision. (CDG; P 4)

The clinical learning experience is an essential component of learning within nursing practice as it enables the students to integrate their theoretical and conceptual knowledge (Ironside, McNelis & Enright, 2014; Murphy, Rosser, Bevan, Warner & Jordan, 2012).

Students are placed in groups at community health facilities, accredited for teaching and learning for Regulation 425 students by the SANC, who prescribes the number of students to be placed at an HEI to ensure optimal exposure to clinical learning opportunities. The size of these “clinical placement groups” can range between two to six students per accredited health facility.

It was concluded that students should be placed into groups per clinical facility for their clinical practice.

Sub-theme: Assigning small groups to promote effective communication

Lecturers and clinical facilitators indicated that they preferred to be assigned their individual groups of students to work in small groups.

I would prefer just to focus on my own group ... Because otherwise you are going to be too busy if you've got more than the allocated amount of students. (LCFG; P 2)

I think smaller groups will eliminate all this confusion; all the things that we're trying to clarify now. Because if I have 15 students in my group, I will attend to 15 students. My students are my responsibility. (CDG; P 4)

Thus, every lecturer or clinical facilitator would have to be assigned to and be responsible for a certain group of students placed at clinical facilities.

One of the most significant characteristics of small groups is the unavoidable active involvement of all students in the entire learning cycle. Some of the advantages of small groups include a sense of self-directedness; active participation leading to active learning; self-motivation; acceptance of personal responsibility for own progress; transferable skills such as leadership, teamwork, organisation, prioritisation, and encouragement; and problem solving and time management skills (Meo, 2013).

It could be concluded that every lecturer and clinical facilitator will be comfortable to be assigned their student groups per clinical facility to facilitate clinical learning.

Sub-theme: Time scheduling in groups to provide support

The lecturers and clinical facilitators indicated that they want to work with small student groups. The implication would be that lecturers and clinical facilitators would have to be available to their students in the discussion group from the time students' step into the clinical facility at 08h00 until they leave the clinical facility at 16h00.

Are we going to have a plan? Because remember we need to be there for eight hours a day as well, online, the students are going to post questions, have queries. (LCFG; P 4)

Whatever application we're going to use, it is official, its work, it's working hours. So we need to have a schedule and we need to set time apart to address this. (LCFG; P 4)

If you look at practical reasons, say for instance you're at a place where a question is posed to you specifically, and you are not able to answer or respond to the question. Do you understand? So what if we had something like a type of roster and we're looking at the volume of the questions and prepare for the volume of the questions. (CDG; P 3)

The questions were raised regarding availability of the lecturer and clinical facilitator to the students as they are in clinical practice for eight hours per day. A suggestion was made that

lecturers and clinical facilitators should create a time frame during which they would be available on the online discussion group.

It could be concluded that a schedule would have to be created to ensure that a lecturer or clinical facilitator was available to students while they were in their clinical placement.

Sub-theme: Sharing discussions once a week

Lecturers and clinical facilitators suggested the information of the discussion group should be made available to all students by the end of each week.

What about every week, at the end of the week? Compiling every information together and forward all the information to the groups? (CDG; P 4)

Remember that the students are going to speak to the clinical supervisor, guiding them with what they're struggling with. If we can have it on a weekly basis, like for instance, on a Thursday, give it to us and then we can discuss it in our clinical, practical sessions on the Friday. (CDG; P 3)

We can use your questions, you can use your questions, compile your questions in such a way that during your practical sessions, you can use their questions based on in a form of a tutorial with the students at the end of every week. (CDG; P 3)

There was a suggestion that the discussion information should be made available to the students on a weekly basis.

It could be concluded that discussions have to be made available to every student each week during the intervention.

5.5 CONCLUSION: STUDENTS

Smartphones could be a good mode of communication, especially in areas where students would not have access to a computer. The functions available on mobile devices (e.g. WhatsApp Messenger) could enhance continued communication. A participant will have to bring their own device (BYOD) that can access the relevant applications (e.g. WhatsApp Messenger or Facebook) and provide technical affordances (such as the ability to adapt to bandwidth available, connecting to the Internet with speed and efficiency) to participate in the m-learning

intervention. Affordability would be an important factor to consider for a m-learning intervention when deciding on the most appropriate application to use.

WhatsApp Messenger, a cross-platform mobile messaging application, could be used to make and stream short videos of a clinical skill (lecturers) and to ask clarifying questions (students) during the application of theoretical knowledge. Some students may not be able to participate in the study if they do not have Internet access off-campus or a mobile device that can download WhatsApp Messenger. There were concerns among students about making a decision about an accessible method of communication that may not be accepted by others.

Internet connectivity is available free of cost or at a relatively small fee when off-campus. WhatsApp Messenger could offer real-time communication between students and lecturers and clinical facilitators. Lecturers and clinical facilitators had to be available in the WhatsApp Messenger group while the students are in the clinical facility (08h30–16h30) to ensure accessibility and to provide instant responses to a problem or query. Students decided on WhatsApp Messenger as the method of communication as it would enable them to send text messages, pictures or voice notes. Students indicated that WhatsApp Messenger offers affordances that could contribute to the introduction of m-learning into an undergraduate nursing programme to enhance ITCP using mobile devices.

WhatsApp Messenger was identified as the application of choice to allow communication between students and lecturers and clinical facilitators. WhatsApp Messenger would be a cheaper method of communication and this affordability makes it possible for students to link or connect with their lecturers or clinical facilitators. WhatsApp Messenger was perceived as being user-friendly as you are able to see who is online, review discussions, and use the discussions for study purposes and access information from lecturers and clinical facilitators. When challenges were encountered when in clinical practice, WhatsApp Messenger allowed immediate responses to the questions. WMGs have to be established to facilitate communication and to allow students access to information or communication from their lecturers and clinical facilitators in real-time (thus no time delay), wherever or whenever. As every student and lecturer and clinical facilitator have an email account and access to Internet connectivity, emails could be used to email large documents.

Facebook was considered as a preferred method of communication but was ranked below email and WhatsApp Messenger. However, some students did not want to use Facebook as a mode of communication because they do not want their family and friends to view their academic performance on their Facebook page. Permission will have to be obtained from students and lecturers and clinical facilitators to allow reading, editing, uploading, downloading, broadcasting, viewing and administering of information received from them during the implementation of the study. It could be concluded that students had mixed reactions to using Facebook as a method of communication.

Students were able to clarify among themselves that both WhatsApp Messenger and emails are to be used to communicate due to their accessibility and affordability. Although Facebook was also indicated as one of the preferred methods of communication, it was ranked below email and WhatsApp Messenger. After much deliberation, the student participants decided that WhatsApp Messenger would be their first choice (as it offers real-time communication and most of the affordances for a mobile technology intervention), supported by email to communicate larger documents.

Registered nurses in clinical practice are to be provided with the students' clinical learning outcomes and the nurse has to be informed that they have to practice in a professional and ethically correct manner as students observe them closely and acquire the clinical skills they see being practised. Due to the heavy workload of registered nurses within clinical facilities, they were not readily available to students, who identified this as a problem. Maintaining professionalism while using mobile devices within clinical facilities will have to be guaranteed. To ensure uniformity, lecturers and clinical facilitators would have to ensure that all students have access to the same amount of information during the intervention using the case-base methodology. Learning could take place from both a prepared case or case study and an actual case that was managed within in the clinical facility.

The need for interactive learning opportunities has been identified. There will have to be set time frames for communication between students and their lecturers and clinical facilitators to ensure that students respect lecturers' and clinical facilitators' personal off-duty time. Students will consult fellow students, the MKO, as a resource within the WhatsApp Messenger group after hours.

The SMS's was identified as not suitable for a m-learning intervention due to the cost involved, which would negatively impact affordability. Mxit was identified as not suitable for a m-learning intervention as students viewed Mxit to be associated with school learners. It was also not cost-effective to download the application.

5.6 CONCLUSION: LECTURERS AND CLINICAL FACILITATORS

The initial response to the introduction of a m-learning initiative to enhance teaching and learning was very positive. Lecturers and clinical facilitators identified that mobile devices could be used to encourage learning. Mobile devices could be used as a resource to create an open-door policy between lecturers and clinical facilitators and their students. Mobile devices could facilitate communication between students and lecturers and clinical facilitators as almost everyone has a mobile device and it is very portable due to its size. Mobile devices could be used to facilitate peer learning and WhatsApp Messenger could be an appropriate application for a m-learning intervention. Emails would be suitable for disseminating videos and larger documents during a m-learning intervention. Facebook is a platform that can be used to share experiences, but WhatsApp Messenger is the preferred mode of communication (supported by email for larger documents).

The LMS of the HEI offered on the Sakai platform, iKamva, could be actively used to share discussion and documents. Affordability and accessibility to m-learning could afford lecturers and clinical facilitators with a platform to encourage and support collaborative student learning. Students and lecturers and clinical facilitators would have had to meet the inclusion criteria to be part of the study, which includes having access to a reliable Internet connection off-campus.

Cognisance has to be taken of the mobile (cell) phone policy of facilities. Students should be given an opportunity to compile a case managed at their clinical facility and real-life images could be obtained to support their case. The PCCSM focuses on certain common conditions that are managed at a primary care level and students are expected to identify a condition based on signs and symptoms presented. Students should be granted an opportunity to summarise and present an actual case managed in the facility to the class; however, an example of how to formulate a case study should be provided. Students should be placed into groups per clinical facility for their clinical practice. Every lecturer and clinical facilitator identified that they would be comfortable to be assigned their own group of students per allocated clinical facility to

facilitate clinical learning. A schedule would have to be created to ensure that a lecturer or clinical facilitator is available to students while they were in their clinical placement. Discussions have to be made available to every student at the end of each week during the intervention.

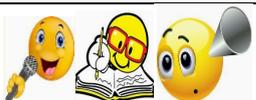
5.7 CONCLUDING STATEMENTS IDENTIFIED AS DRAFT DESIGN PRINCIPLES

The following draft design principles need to be included in the intervention in Chapter 7, supported by the affordances (Bower, 2008) for every identified draft principle, as outlined in Table 5.4.

Colour key chart

	Authentic learning		Situated learning		Flexible learning		Social Constructivism		Blended learning
--	--------------------	--	-------------------	--	-------------------	--	-----------------------	--	------------------

Table 5.4: Rules identified as draft design principles

DRAFT DESIGN PRINCIPLES	AFFORDANCE	EMOTICON
Smartphones could be a good mode of communication during a m-learning intervention due to its portability, especially in areas where students would not have access to a computer.	Accessibility Move-ability	
The functions available on mobile devices could enhance continued communication during a m-learning intervention e.g. WhatsApp Messenger.	Speak-ability Write-ability Listen-ability	
A participant will have to 'bring their own device' (BYOD) (that can access the relevant applications, e.g. WhatsApp Messenger or Facebook) to participate in the m-learning intervention.	Accessibility	
Students and lecturers and clinical facilitators must be in possession of a mobile device that could be used on various platforms and provide technical affordances such as the ability to adapt to available bandwidth, connect to the Internet with speed and efficiency.	Accessibility Affordability Link-ability Search-ability	

	WhatsApp Messenger, a cross-platform mobile messaging application, was identified as an accessible, user-friendly and an affordable method of communication for a m-learning intervention as it enables sending and receiving text messages, pictures or voice notes.	View-ability, Watch-ability Write-ability Speak-ability Listen-ability	
	WhatsApp Messenger allows immediate response in real-time, thus no time delay, to questions when a challenge is encountered while in clinical practice.	Accessibility	
	WhatsApp Messenger could be used to make and stream short videos of a clinical skill and to ask questions for clarification to assist students with the application of theoretical knowledge while practising a clinical skill.	Video- production-ability Watch-ability Speak-ability	
	Students and lecturers and clinical facilitators will have to meet the inclusion criteria to be part of the study and participation includes having access to a reliable Internet connection off-campus.	Browse-ability Link-ability Search-ability	
	WMGs have to be established to make communication easier and allow students access to information or communication from their lecturers and clinical facilitators wherever or whenever.	Accessibility Link-ability Share-ability	
	Students should be placed into groups per clinical facility for their clinical practice and every lecturer and clinical facilitator will be assigned their student groups per clinical facility to facilitate learning.	Accessibility Link-ability Share-ability	
	Lecturer and clinical facilitators have to be available in the WhatsApp Messenger group while the student is in the clinical facility to ensure accessibility and to provide instant responses to a problem or query.	Accessibility Link-ability Share-ability	
	As every student and lecturer and clinical facilitator have an email account and have access to Internet to access emails, larger course-related documents could be emailed.	Accessibility Link-ability Share-ability	
	Permission will have to be obtained from students and lecturers and clinical facilitators to allow the reading, editing, uploading, downloading,	Permission-ability Share-ability	

	broadcasting, viewing and administering of information received from them during the m-learning intervention.		
	Registered nurses in clinical practice have to be informed that they have to practice in a professional and ethically correct manner as students observe them and acquire the clinical skills through this observation.	View-ability Watch-ability	
	Students experienced challenges receiving guidance on clinical skills from registered nurses within clinical facilities due to their workload.	Accessibility Production-ability	
	Maintaining professionalism regarding the use of mobile devices while within clinical facilities will have to be guaranteed.	Permission-ability	
	To ensure uniformity, lecturers and clinical facilitators have to provide all students with the "same amount of information" during the intervention, using the case-base methodology.	Accessibility Synchronicity	
	Learning can take place from both a prepared case or case study and an actual case that was managed within in the clinical facility.	Integrate-ability	
	It can be concluded that the need for interactive learning opportunities has been identified.	Accessibility Integrate-ability	
	There will have to be set time frames for communication between students and their lecturers and clinical facilitators to ensure that students respect their superiors' off-duty time.	Accessibility	
	Students will consult peers, the MKO, as a resource within the WhatsApp Messenger group after hours.	Accessibility Share-ability	
	Mobile devices could be used as a resource to create an open-door policy between lecturers and clinical facilitators and their students.	Accessibility Share-ability	
	The LMS of the HEI offered on the Sakai platform, iKamva, could be actively used to share discussion and documents.	Accessibility Share-ability	

	Cognisance has to be taken of the mobile (cell) phone policy of clinical facilities and the importance of obtaining of permission to conduct the study at clinical facilities.	Permission-ability	
	The PCCSM focuses on certain common conditions that are managed at a primary level of care and students are expected to identify a condition based on signs and symptoms presented.	Combine-ability	
	Students should be granted an opportunity to summarise and present an actual case with “real-life images” managed in the facility; however, an example should be provided on how to formulate a case study.	Combine-ability	

([google.co.za/search?q=pictures+of+whatsapp+emoticons](https://www.google.co.za/search?q=pictures+of+whatsapp+emoticons;); [pinterest.com](https://www.pinterest.com))

5.8 SUMMARY

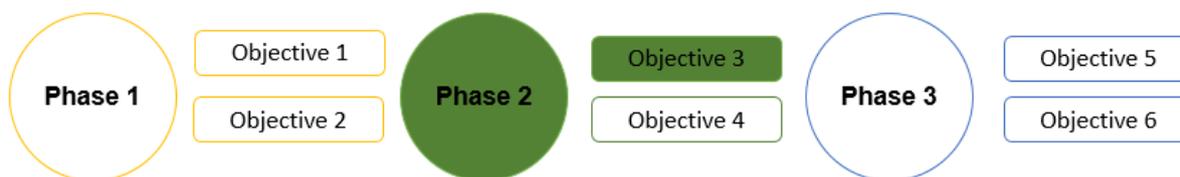
This qualitative chapter, which addresses *Objective 2*, provides a description of the findings of the focus groups and ISSIs conducted with students, and a focus group, ISSIs and conceptualisation group conducted with lecturers and clinical facilitators.

The findings revealed an excitement among students and lecturers and clinical facilitators to embark on a m-learning intervention to enhance the integration of the theory and clinical practice of the ENT health assessment in the PCCSM.

Concerns identified that could impact the study included the limited availability of smartphones and limited access to public or free Internet. Positive contributions included the outcome of the exploration that indicated that WhatsApp Messenger would be the most appropriate method of communication due to its affordability.

This chapter, as part of Phase 1, in conjunction with the literature review, quantitative findings (Objective 1) and the results from the qualitative findings (Objective 2) (the exploration and description of the perceptions of students and lecturers and clinical facilitators on ITCP of the ENT health assessment in the PCCSM through m-learning) informed the development of the plan (Chapter 6).

6 CHAPTER: DEVELOPING A PLAN FOR AN ENACTMENT (INTERVENTION)



“Tell me and I forget. Teach me and I remember. Involve me and I learn.”

Benjamin Franklin

6.1 INTRODUCTION

The quantitative and qualitative findings (Objectives 1 and 2) informed this chapter on the Enactment Phase 2 - Objective 3, which is:

to develop a plan for the intervention for the integration of the theory and practice theory and clinical practice (ITCP) of the ENT health assessment in the primary care and clinical skills module (PCCSM) through m-learning in an undergraduate nursing programme at a HEI in the WCP.

This plan included a draft of the design-based principles from the exploratory phase (Chapters 3, 4 and 5). This chapter focuses on the development of the plan that was implemented with the preliminary principles refined in the enactment (intervention) (Chapter 7).

The development of a plan for an enactment (intervention) was to enhance the integration of the theory and clinical practice of the ENT health assessment.

“The outcomes of design-based research (DBR) are a set of design principles or guidelines derived empirically and richly described, which can be implemented by others interested in studying similar settings and concerns” (Amiel & Reeves, 2008).

The development of the design principles in the plan forms part of an ongoing DBR process. Initially, the draft design principles are rarely perfect and various cyclic iterations allow for improvement/refinement in the design (Anderson & Shattuck, 2012). In this study, three

iterations (Chapter 7) through authentic practices were needed to obtain the final design principles (Table 8.1).

Background to the development of the draft design principles of the plan in the exploration phase

Draft design principles, created during the exploration phase (Chapters 3, 4 and 5), were formulated for the plan. Pedagogical and technological affordances were identified from the following data collection approaches during the exploration phase:

- A literature review;
- Results from the quantitative findings that focused on the exploration and description of the students' and lecturers and clinical facilitators' perceptions of the affordances of mobile devices (Objective 1); and
- Results from the qualitative findings (Objective 2) focused on the exploration and description of the perceptions of students and lecturers and clinical facilitators on ITCP of the ENT health assessment in the PCCSM through m-learning.

The exploration phase was characterised by the documentation of the insights gained from the literature review (Chapter 3) that provided information models and strategies for design, and strategies for quantitative and qualitative data collection. The findings and discussions from the literature review, and the quantitative and qualitative data collected during the exploration phase of the ILDF characterise the first refinement of the draft design principles for the enactment (intervention) (Table 6.1).

The quantitative electronic survey provided information about the knowledge of students and lecturers and clinical facilitators on their comprehensive uses of mobile devices. Their views on the development of a m-learning enactment or online learning design were also explored. The analysis of the quantitative data collected (Chapter 4) informed the qualitative data collection process. Qualitative data was collected through individual interviews, focus groups and a CDG session. The qualitative data collected was formally documented after analysis (Chapter 5).

Table 6.1: First refinement of the draft design principles for the intervention in the enactment phase

DRAFT DESIGN PRINCIPLES (DDP) (DABBAGH & BANNAN-RITLAND, 2005) IDENTIFIED AS RULES IN THE EXPLORATORY PHASE IN CHAPTERS (CH) 3, 4 AND 5	REFINEMENT OF DRAFT DESIGN PRINCIPLES SUPPORTED BY THE AFFORDANCES (BOWER, 2008)	SOURCE/ REFERENCE
Social interaction plays an important role in the cognitive development of the student, as outlined by social constructivism of Vygotsky (1978) and as a theoretical underpinning of this study. (CH 3: DDP 10)	Acknowledge the role of social interaction in the cognitive development (<i>accessibility, link-ability</i>) of the student.	Vogt, Maschwitz and Zawachi-Richter, 2010
Situating learning is the appropriate learning theory with the constructivist epistemological orientation that indicate the role of the student (learner) and lecturers and clinical facilitators (instructor) and the implications for instruction. (CH 3: DDP 9)	Identify an appropriate learning theory, e.g. situated learning (<i>reliability</i>).	Brown, Collins and Duguid, 1989; Brown, 2009; Lave and Wenger, 1991
The nine characteristics of the authentic learning are important in establishing knowledge and skill within a real-life setting. (CH 3: DDP 13)	Illustrate the application of the nine characteristics of authentic learning (supported by flexible and blended learning environments) aimed at enhancing students' online learning experiences (Chapter 3; Table 3.5). Affordances of a blended learning environment using	Herrington and Oliver, 2000; Reeves and Okey, 1996; Herrington and Herrington, 1998 in Herrington and Herrington, 2006.
Combinations of face-to-face and online learning experiences (blended learning) create an interactive learning platform. (CH 3: DDP 15)	mobile devices include <i>accessibility, link-ability, write-ability, readability, view-ability, speak-ability, listen-ability and share-ability</i> .	Shurville, O'Grady and Mayall 2008
		Garrison and Vaughan, 2008
Every individual student learns to use the social media application on their mobile devices at any time or any place to suit their learning needs, in a flexible learning environment. (CH 3: DDP 2, 3, 8 & 14; CH 4: DDP 5; CH5: DDP 2)	Introduce a blended learning approach to prepare students and lecturers and clinical facilitators for an online m-learning enactment (intervention) using WhatsApp Messenger (<i>accessibility, write-ability, readability, view-ability, speak-ability and listen-ability</i>).	Wu and Patel, 2016; Makoe 2012; Nicholson 2002; Rambe and Bere 2013; Yeboah and Ewur 2014; Barhoumi, 2015
Cultivate a positive attitude towards the use of personal mobile devices for a m-	Allow students to learn using the functions on their mobile devices at any time or any place to suit their individual learning needs	Baldwin, Mills, Birks and Budden, 2014; Aamodt

learning enactment (intervention). (CH 4: DDP 7 & 8)	<i>(accessibility, link-ability, write-ability, readability, view-ability, speak-ability, listen-ability and share-ability)</i>	and & Plaza, 1994; Le Roux and Khanyile, 2012
Social interaction among students (includes the MKO and the ZPD by the two main principles underlying the Vygotskian Framework) supports cognitive development. (CH 3: DDP 10)	Acknowledge the role of the MKO in peer support <i>(accessibility, link-ability, speak-ability and listen-ability)</i> .	Vygotsky 1978:86; Cochrane, 2014; Makoe, 2012; Nicholson, 2002; Bere, 2013
Preparation of all students and lecturers and clinical facilitators for an authentic WhatsApp Messenger ensures the success of a m-learning enactment (intervention). (CH 3: DDP 5 & 3; CH 4: DDP 4; CH 5: DDP 2)	Acknowledge the importance of the preparation and presentation of an actual case study to enhance learning <i>(accessibility, link-ability, speak-ability and listen-ability)</i> .	Le Roux and Khanyile, 2012
Social interaction among students (includes the MKO and the ZPD by the two main principles underlying the Vygotskian Framework) supports cognitive development. (CH 3: DDP 10)	Provide resources during a m-learning enactment (intervention) due to challenges identified to access library search engines off-campus <i>(accessibility, share-ability, link-ability, readability and view-ability)</i> .	Gupta and Koo, 2010; Mason and Rennie, 2008; Walton, Childs and Blenkinsopp, 2005; Kenny, Van Neste-Kenny, Burton, Park and Qayyum, 2012
Interactive and collaborative learning opportunities is extended by students consulting peers, the MKO, as a resource within a WhatsApp Messenger group after hours (CH 3: DDP 7; CH 5: DDP 19 & 21)	Establish WMGs to enhance interactive and collaborative communication and to ensure that students have access to the "same amount of information". <i>(accessibility, link-ability, write-ability, readability, view-ability, speak-ability, listen-ability and share-ability)</i> .	Johnson, Onwuegbuzie and Turner, 2011; Makoe 2012; Nicholson 2002; Rambe and Bere 2013; Yeboah and Ewur 2014; Barhoumi, 2015
The LMS of the HEI, offered on the Sakai platform, iKamva, could be actively used to share discussions and documents. CH 5: DDP 23)		
Students should summarise and present an actual case with real-life images managed in clinical facilities and be provided with an example of a case study formulation. (CH 5: DDP 25 & 26)		
Learning using mobile devices is implemented from both prepared cases or a case	Prompt students with online tasks to be completed as communicated	Johnson, Onwuegbuzie and Turner, 2011;

study and an actual case that was managed based on certain common conditions within in the clinical facility. (CH 5: DDP 18, 25 & 26)	via WhatsApp Messenger (<i>accessibility, link-ability, write-ability, readability, view-ability, speak-ability, listen-ability and share-ability</i>).	Makoe 2012; Nicholson 2002; Rambe and Bere 2013; Yeboah and Ewur 2014; Barhoumi, 2015
Resources are available during a m-learning enactment (intervention) to combat challenges to access library search engines off-campus. (CH 4: DDP 6; CH 5: DDP 15 & 22)		
WMGs are established for every clinical facility to enhance interactive and collaborative communication and to ensure that all students have access to the "same amount of information". (CH 3: DDP 6; CH 5: DDP 9, 10 & 17)	BYOD to participate in an online m-learning enactment (intervention) using WhatsApp Messenger as the mode of communication to enhance ITCP (<i>accessibility, link-ability and share-ability</i>).	Cook, 2010; McAndrew and Johnston, 2012; Rung, Warne and Mattheos, 2014
Mobile devices are used as a resource to create an 'open door policy' between lecturers and clinical facilitators and their students. (CH 5: DDP 22)		
Students should receive guidance on clinical skills from professional nurses within clinical facilities as part of their workload. (CH 5: DDP 15)	Provide technical support to students and lecturers and clinical facilitators should they experience challenges with their mobile devices (<i>accessibility</i>)	Liu and Chu, 2010
Provide opportunities for visualisation and interaction with learning content by using personal mobile devices e.g. WhatsApp Messenger (BYOD) (CH 3: DDP 4 & 12; CH 5: DDP 3 & 4)	Prompt students to explore the online learning activity to enhance their learning using WhatsApp Messenger (<i>accessibility, link-ability, write-ability, readability, view-ability, speak-ability, listen-ability and share-ability</i>).	Cochrane and Bateman, 2010; Cochrane <i>et al.</i> , 2014
WhatsApp Messenger, a mobile messaging application, should be used in a m-learning enactment (intervention) as it allows for immediate responses in real-time. (CH 4: DDP 11 & 12; CH 5: DDP 5, 6 & 7)	Communicate learning tasks within the identified time frame (<i>accessibility, link-ability, write-ability, readability, view-ability, speak-ability, video produce-ability and share-ability</i>).	Lai, Yang, Chen, Ho and Chant, 2007
A smartphone, with its technological advances, is a mode of communication used to enhance ITCP. (CH 3: DDP 1; CH 4: DDP 1, 10 & 14; CH 5: DDP 1 & 2)	Motivate students to uphold professionalism while in clinical practice facilities (<i>reliability and focus-ability</i>).	Baldwin, Mills, Birks and Budden, 2013; Freshwater and Maslin-Prothero, 2005; Harris, Nagy and Vardaxis, 2014

The literature review and quantitative and qualitative findings informed the development of the first iterations design framework, created to enhance ITCP of the ENT health assessment through m-learning in an undergraduate nursing programme. The insights and findings from the gathered information were thus compiled.

This chapter includes authentic, flexible and blended learning draft design guidelines created within a situated learning environment to enhance the integration of the theory and clinical practice of the ENT health assessment employing the affordances of mobile devices (Table 6.1).

6.2 PREPARATION OF THE PLAN FOR THE INTERVENTION IN THE ENACTMENT PHASE

6.2.1 Strategic session with field specialist and preparatory workshop

A strategic planning session was first held with the lecturers and clinical facilitators, specialists in the field of primary healthcare, with specific reference to their facilitation of the PCCSM. These field specialists acknowledged and confirmed the principles of the findings of Phase 1 (Objectives 1 and 2) that align with those of Bower (2008) (Table 6.1). These principles are outlined as the draft design principles in Table 6.1.

6.2.2 Preparation workshop

A workshop for all the participants was planned in preparation for the intervention in the enactment phase of the study, as indicated in Table 6.2.

Table 6.2: Workshop preparation: guidelines for enactment (intervention)

PREPARATION GUIDE FOR THE WORKSHOP
<p>PREPARATION – GENERAL</p> <p>A workshop was planned (Figure 6.4) to prepare every student and lecturers and clinical facilitators for the m-learning enactment (intervention) using WhatsApp Messenger as a mode of communication to enhance ITCP.</p> <p>At the start of the workshop, students and lecturers and clinical facilitators were informed that the smartphone application for this study was WhatsApp Messenger (for interactive and collaborative communication). Email was used to communicate larger documents when the need arose during the enactment phase.</p> <p>A general discussion was initiated to depict the affordability of WhatsApp Messenger in relation to the financial implication of sending a SMS or to make a phone call, in order to instil a positive attitude towards the m-learning enactment (intervention) of choice.</p> <p>During the workshop, students and lecturers and clinical facilitators were guided on how to download WhatsApp Messenger, a cross-platform mobile messaging application, onto their mobile devices (if they do not have it already).</p> <p>A short video titled “What is WhatsApp Messenger?” was played to ensure that all students and lecturers and clinical facilitators were prepared for the enactment (www.youtube.com/watch).</p>
<p>The findings of an article that speaks to the benefits of a m-learning enactment (intervention) using WhatsApp Messenger were presented during the workshop. The findings indicated the students’ view on how mobile devices could be used to enhance ITCP.</p>
<p>Students participated in the ENT health assessment activity over a six-week period.</p> <p>Students were to receive a two-day, weekly theory session on the ENT health assessment, followed by a clinical learning session within clinical practice.</p> <p>The clinical teaching and learning experiences of students were facilitated by the researcher and the respective clinical facilitators reviewed and commented on students’ responses to the activities communicated while they were at the clinical facilities.</p> <p>Every facility group had to respond to the communicated activity, even if there was a duplication of answers. Students and lecturers and clinical facilitators were informed that their mobile devices would have to be available and connected to the Internet from 08h30 to 16h00 on clinical practice days.</p> <p style="text-align: center;">- Programme to be offered during the workshop</p> <p>The following programme was discussed in preparation of the enactment (intervention) of the ENT health assessment during term two in 2016, as set out in the module descriptor for the PCCSM (Annexure 23).</p> <p>Week 1: Day 1: Theory session on the ear</p> <p>A formal theory session on common conditions of the ear managed at a primary level of care and included: a</p>

review of the anatomy and physiology of the ear; history taking; pathophysiology; diagnosis; drug & non-drug management; health education; and referral systems, would be presented using PowerPoint slides (Chapter 7; Figure 7.4).

Week 2: Day 1: The ear: clinical facility

Clinical practice of the health assessment of the ear at clinical facilities

1. 10h00 – A labelled picture of the anatomical structure of the ear was communicated and had to be completed.
2. 11h00 – Students were prompted to produce a short video to demonstrate their examination technique of the ear.
3. 14h00–16h00 – Feedback on the activities completed were provided by the allocated clinical facilitator responsible for the clinical learning of the individual groups.

Week 2: Day 2: The ear: clinical facility

Clinical practice of the health assessment of the ear at clinical facilities

1. 10h00 - Every facility group had to submit a short case study of a patient at the clinical facility who presented with a condition or complaint related to the ear. To ensure anonymity and confidentiality, the patients' name, surname and folder number could not be included in the short case study.
2. The following framework was used as a guide to complete the case study:
 - History taking: What did the patient present with?
 - Which investigations were done?
 - What was the diagnosis?
 - Discuss the physiological process that took place in the ear to give an understanding of the diagnosis.
 - What was the drug and non-drug management?
 - Was there any referral done?
3. The use of pictures to support findings was permitted. If unable to take a picture (pictures could only be taken at identified facilities where permission had been obtained), an exact picture could be sourced using the Internet, but it has to be referenced.
4. 16h00 – Feedback on the activities had to be provided by the allocated clinical facilitator responsible for the clinical learning of the individual groups.
5. At the end of the clinical placement week, students and lectures and clinical facilitators were requested to submit a reflection of their experiences by answering the following question: “How was this experience for you?”

Week 3: Day 1: Theory session on the nose and sinuses

1. The session started informally with a review of the discussions that took place in the WMGs on the ear while in clinical practice the previous week.
2. Students were allowed to ask questions for clarification where needed.
3. A formal theory class session was presented using PowerPoint slides (Chapter 7; Figure 7.7) on common conditions of the nose and sinuses managed at a primary level of care that included: a review of the anatomy and physiology of the nose and sinuses; history taking; pathophysiology; diagnosis; drug & non-drug management; health education and referral systems.

Week 4: Day 1: The nose and sinuses: clinical facility**Clinical practice of the health assessment of the nose and sinuses at clinical facilities**

1. 10h00 – A labelled picture of the anatomical structure of the nose and sinuses was communicated.
2. 11h00 – Students were prompted to produce a short video to demonstrate their examination technique of the nose and sinuses.
3. 14h00–16h00 – Feedback on the completed activities was provided by the allocated clinical facilitator responsible for the clinical learning of the individual groups.

Week 4: Day 2: The nose and sinuses: clinical facility**Clinical practice of the health assessment of the nose and sinuses at clinical facilities**

1. 10h00 – Every facility group had to submit a short case study of a patient at the clinical facility who presented with a condition or complaint related to the nose and sinuses. To ensure anonymity and confidentiality, the patients' name, surname and folder number could not be included in the short case study.
2. The following framework was used as a guide to complete the case study:
 - History taking: What did the patient present with?
 - Which investigations were done?
 - What was the diagnosis?
 - Discuss the physiological process that took place in the nose and sinuses to provide an understanding of the diagnosis.
 - What was the drug and non-drug management?
 - Was there any referral done?
3. The use of pictures to support findings was permitted. If unable to take a picture (pictures could only be taken at identified facilities where permission had been obtained), an exact picture can be sourced using the Internet, but it has to be referenced.
4. 16h00 – Feedback on the activities had to be provided by the allocated clinical facilitator responsible for the clinical learning of the individual groups.
5. At the end of the clinical placement week, there was a request to students and lectures and clinical facilitators to reflect on their experiences by answering the following question: “How was this experience for you?”

Week 5: Day 1: Theory session on the mouth & throat

1. The session started informally with a review of the discussions that took place on the WMGs on the nose and sinuses while in clinical practice the previous week.
2. Students were allowed to ask questions for clarification where needed
3. A formal theory class session on common conditions of the mouth and throat (managed at a primary level of care) that included: a review of the anatomy and physiology of the mouth and throat; history taking; pathophysiology; diagnosis; drug & non-drug management; health education and referral systems, was presented using PowerPoint slides (Chapter 7; Figure 7.10).

Week 6: Day 1: The mouth and throat: clinical facility

Clinical practice of the health assessment of the mouth and throat at clinical facilities

1. 10h00 – A labelled picture of the anatomical structure of the mouth and throat was communicated.
2. 11h00 – Students were asked to produce a short video to demonstrate their examination technique of the mouth and throat.
3. 14h00–16h00 – Feedback on the completed activities were provided by the allocated clinical facilitator responsible for the clinical learning of the individual groups.

Week 6: Day 2: The mouth and throat: clinical facility

Clinical practice of the health assessment of the mouth and throat at clinical facilities

1. 10h00 – Every facility group had to submit a short case study on a clinical facility patient who presented with a condition or complaint related to the mouth and throat. To ensure anonymity and confidentiality, the patients' name, surname and folder number could not be included in the short case study.
2. The following framework was used as a guide to complete the case study:
 - History taking: What did the patient present with?
 - Which investigations were done?
 - What was the diagnosis?
 - Discuss the physiological process that took place in the mouth and throat to give an understanding of the diagnosis.
 - What was the drug and non-drug management?
 - Was there any referral done?
3. The use of pictures to support findings was permitted. If unable to take a picture (pictures can only be taken at identified facilities where permission has been obtained), an exact picture can be sourced using the Internet, but it has to be referenced.
4. 16h00 – Feedback on the activities had to be provided by the allocated clinical facilitator responsible for the clinical learning of the individual groups.
5. At the end of the clinical placement week, students and lectures and clinical facilitators were requested to submit a reflection on their experiences by answering the following question: "How was this experience for you?"

- Principles to be outline during the workshop

During the workshop, students were divided into facility groups. Every clinical facilitator was assigned to a clinical facility to facilitate clinical learning. WMGs for students and their allocated clinical facilitator within the workshop were created. Group members were given an opportunity to introduce themselves within the WMG (using one sentence or an icon) to initiate the discussion.

Every student and lecturers and clinical facilitators who would participate in the enactment (intervention) had to use their own mobile device, as set out in the inclusion criteria of the study. Students who were not in possession of a mobile device were guided by the following video on how to download and install WhatsApp Messenger on their Windows PC if they wanted to participate in the study (www.youtube.com/watch).

A practical session was conducted during the workshop where students and lectures and clinical facilitators were shown how to download the mobile application of the PHC Clinical Guide onto their individual mobile devices. Students and lectures and clinical facilitators were able to use the mobile application of the PHC Clinical Guide to guide them in the management of common conditions while in clinical practice.

During the workshop it was established that every student and lecturers and clinical facilitators would use their email account and access the Internet to enable them to receive large documents.

The mobile (cell) phone policy of the Western Cape Department of Health Facilities was presented during the workshop. Students were reminded that they could only use their mobile devices to participate in the study during their tea and lunch breaks, as agreed upon while in clinical practice.

- Principles to be emphasised for the enactment (intervention) during the workshop

Students and lecturers and clinical facilitators had to ensure that they were connected to the Internet at own cost during the enactment.

Due to the ethical parameters of the enactment (intervention), the researcher (as actor) was to be contacted if any challenges were experienced with the mobile devices of participants. This was done to ensure that the information of patients was kept confidential.

The daily discussion within the WMGs while students should be within clinical facilities, and the sharing of voice notes, videos, class notes, etc. provided an 'open door policy' that enhanced ITCP of the ENT health assessment.

- Outlining the roles of the stakeholders/community for the enactment

Interactive collaboration between the students and lectures and clinical facilitators were planned for the WMGs during the theoretical and clinical sessions of the ENT health assessment over the six-week period.

The clinical facilitators who worked daily with registered nurses within the clinical practice areas were tasked to inform the registered nurses that students closely observe their practices and acquire their skills through observation. The registered nurses were therefore expected to perform their duties and management of patients as set out in their scope of practice (guided by SANC).

The lecturer or clinical facilitators had to be available within the WMG while the students were within the clinical facility from 08h30– 16h30, thus ensuring accessibility.

From 16h30, the more knowledgeable peer was encouraged to respond in the group, thus the after-work hours privacy of the lecturers and clinical facilitators was respected.

The preparatory workshop with the students and lecturers and clinical facilitators were therefore held to present the first iterations design framework plan for the enactment (intervention) (Table 6.2) that integrated the affordances principles of Bower (2008) and the draft design principles of Dabbagh and Bannan-Ritland (2005) (Table 6.1). The workshop was part of the development of the plan as outlined in Point 6.3.2.

6.3 OFFERING THE PLAN DURING THE WORKSHOP

During the workshop, the principles of the plan were outlined. Furthermore, the steps of the enactment phase of Dabbagh and Bannan-Ritland (2005) were integrated to develop the plan for the intervention. The first step was identifying the method of instruction, as outlined under Point 6.3.1.

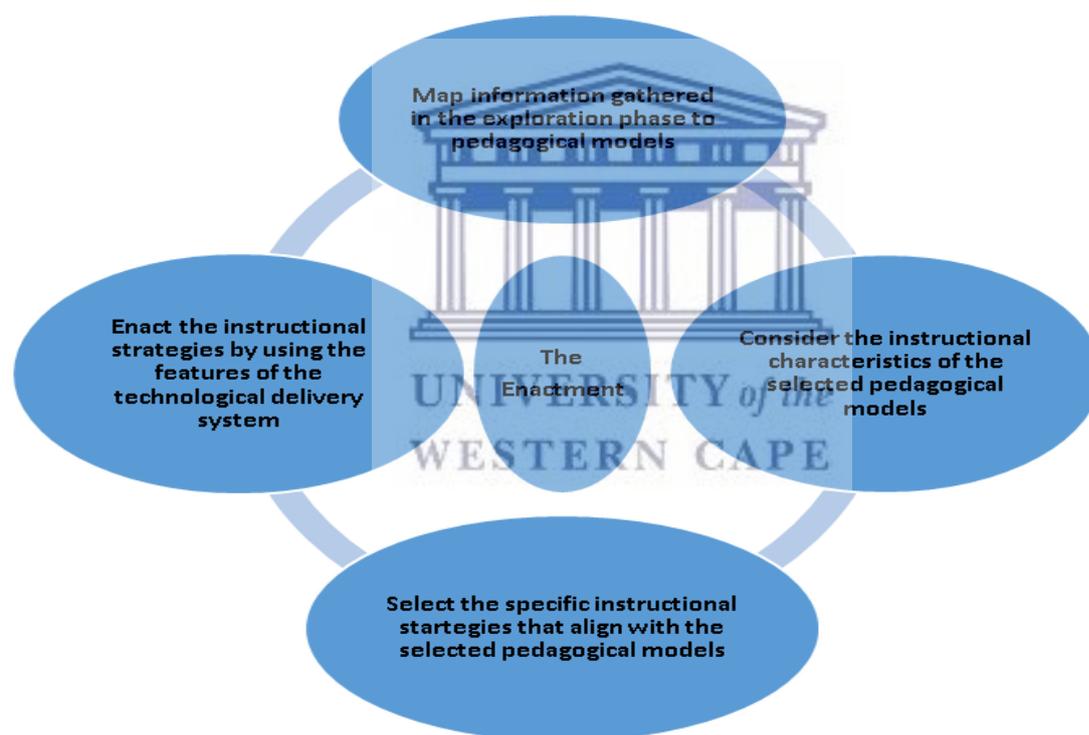


Figure 6.1: Instructional strategies/principles for the enactment

6.3.1 The m-learning application for the instructional environment

Rationale: The method of instruction to enhance ITCP of the ENT health assessment was identified as the WhatsApp Messenger application (tool) by students and lecturers and clinical facilitators in the qualitative phase. WhatsApp Messenger was identified as the “*tool*” of choice to communicate, due to its affordability and because of the affordances that the application

offered. As mentioned in Chapter 1, lecturers and clinical facilitators identified the challenges experienced by third-year undergraduate nursing students concerning ITCP of the ENT health assessment and requested that the researcher seek an innovative technique to solve this problem.

During the workshop: Students were guided to download the mobile application of the Primary Health Care Standard Treatment Guidelines and Essential Medicines List (Figure 6.2), the official treatment guidelines used at all PHC health facilities in South Africa, that was launched at the National Department of Health, Pretoria, on 25 November 2015 as an electronic resource. It is of utmost importance that a proposed research study be appropriate and thought-provoking or attention-grabbing. Kukulska-Hulme, Traxler and Pettit (2007) distinguished that “students should be engaged in exploration and inquiry, they should have opportunities for social discourse, and that ample resources should be available to them as they pursue meaningful problems.”

MOBILE APPLICATION
for the Standard Treatment Guidelines (STGs) and Essential Medicines List (EML) for Primary Health Care (PHC) Level

HOW TO DOWNLOAD ON ANDROID?

- STEP 1:** Go to Google Play Store
- STEP 2:** Open search function
- STEP 3:** Type in "PHC Clinical Guide" and click INSTALL

HOW TO DOWNLOAD ON IOS?

- STEP 1:** Go to App Store
- STEP 2:** Open search function
- STEP 3:** Type in "PHC Clinical Guide" and click INSTALL

LAUNCH OF THE MOBILE APPLICATION OF THE PRIMARY HEALTH CARE STANDARD TREATMENT GUIDELINES AND ESSENTIAL MEDICINES LIST

DATE: 25 November 2015
TIME: 09:30 for 10:00
VENUE: IMPILO BOARDROOM, PODIUM LEVEL, CIVITAS BUILDING

Background
The Primary Healthcare (PHC) Standard Treatment Guidelines (STGs) and Essential Medicines List (EML) was revised in 2014 (first published in 1996, and updated in 1998, 2003 and 2008). The availability of the revised edition of the guideline in mobile application format is intended to improve accessibility and acceptability to healthcare professionals at all levels of care. The mobile application leverages the capabilities of modern smart phone technology to facilitate efficient, point-of-care access to up-to-date medicine information.

Objectives of the launch

- To announce the mobile phone application of the revised edition of the PHC STGs and EML.
- To raise awareness and encourage the implementation and use of the revised guidelines to promote rational medicines use.

PROGRAMME
PROGRAMME DIRECTOR: National Department of Health official

TIME	ITEM
09:30 – 10:00	Registration
10:00 – 10:10	Opening
10:10 – 10:30	Address: Dr Richard Gordon, Executive Director: SA Medical Research Council
10:30 – 11:00	Keynote address: National Department of Health official
11:00 – 11:20	Demonstration on the mobile application of the PHC STGs and EML: Representative from The Open Medicine Project
11:20 – 11:35	Questions and answers from the media
11:35 – 11:45	Closure

Figure 6.2: Guide to download the mobile application with the launch programme



The mobile application of the Primary Health Care Standard Treatment Guidelines and Essential Medicines List (EML) enabled students to research treatment regimens for common conditions identified (Figure 6.3), without having to browse through a paper hard copy. The guide was very user-friendly and was incorporated into the theory session to guide students on the use of the application.

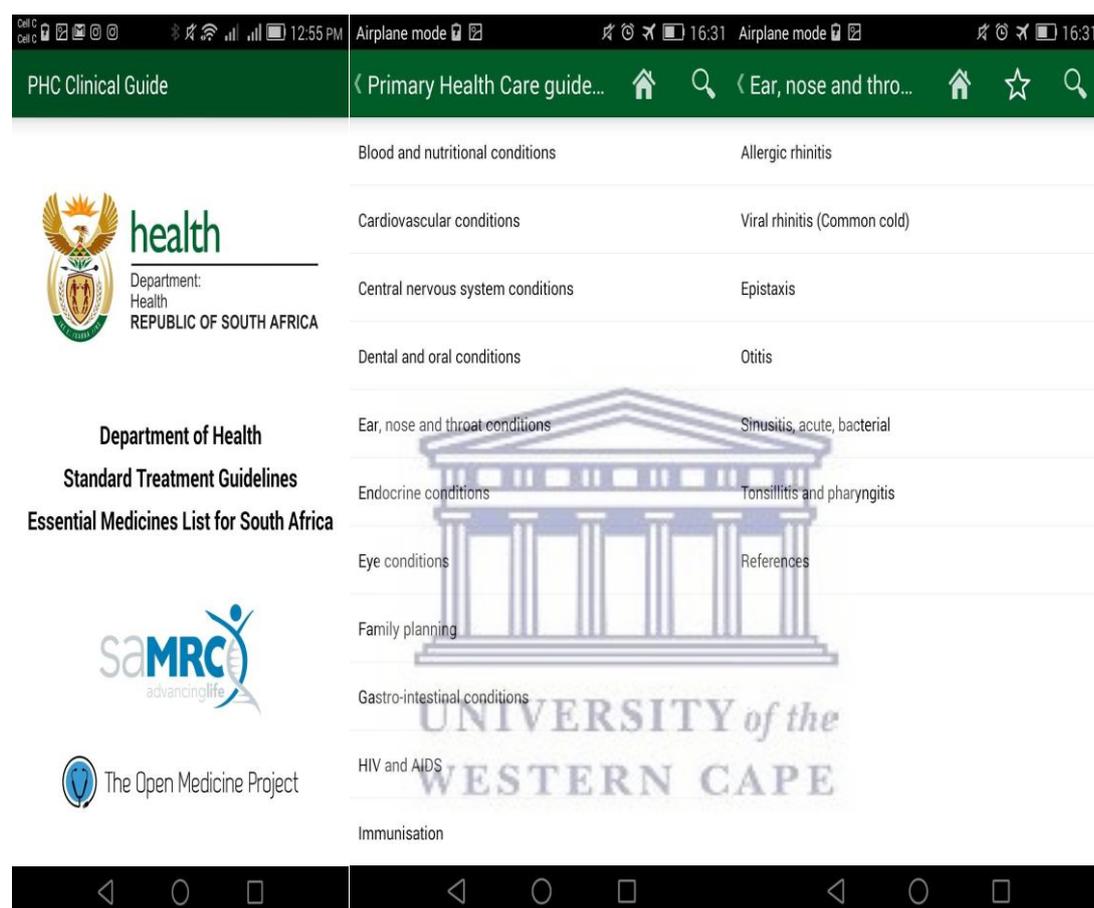


Figure 6.3: Examples of the PHC, STGs and EML mobile application

6.3.2 Examine individual perspectives on the learning process 🤖

Background: The development of the m-learning enactment from a social constructivist perspective provided students with an opportunity to construct knowledge within an authentic, flexible and blended learning environment that enhanced the integration of their theory and clinical practice of the ENT health assessment through m-learning in an undergraduate nursing programme.

The plan was developed to enhance ITCP of the ENT health assessment – based on scientific findings from the review of the literature, quantitative and qualitative data collection and analysis of these findings – was developed.

During this session of the workshop: The plan was shared and the input of the lecturers and clinical facilitators about the practicality of the planned intervention was explored (see Section 6.2). They identified three challenges relating to the WMGs, time of interaction and role clarification, as discussed below.

6.3.2.1 WhatsApp Messenger groups

Background: The initial plan was to only have one WMG and that every lecturer and clinical facilitator would receive a time slot during a working day (between 08h30 to 16h30) to manage the discussion within the WhatsApp Messenger group.

During the workshop: The initial plan on the groups was deemed to be impractical as they identified that it would be extremely difficult for one person to manage an expected “big” group. After much deliberation and planning, it was decided that, as clinical facilities and students are assigned to a specific clinical facilitator, every clinical facilitator would establish a group within his/her clinical facility, resulting in manageable WMGs for each clinical facilitator. Students go into clinical facilities in two groups: group one (1) on a Monday and Tuesday; and group two (2) on a Wednesday and Thursday. It was decided that every clinical facilitator would establish a WMG for the Monday/Tuesday group of students and another group for the Wednesday/Thursday group of students. If a clinical facilitator was allocated six clinical facilities with four students at each clinical facility on a Monday and Tuesday, then all six clinical facilities (with four students at each clinical facility) would be added into one WMG. Each clinical facilitator would then have two WMGs to manage: one on a Monday and Tuesday, and one on a Wednesday and Thursday. The researcher would be added as a participant of each of the groups.

6.3.2.2 Time of interaction

During the workshop: The clinical facilitators made it very clear that their working day was from 08h30 to 16h30 daily from Monday to Friday. This thus had to be the time frame in which they

were available to communicate with students within the WMGs. The time of communication with students was agreed upon. Where needed, peers would be identified as the more knowledgeable students, and students were encouraged to continue with peer consultation on the WMGs after 16h30. There was an understanding that the clinical facilitator would review the discussion of the previous day at 08h30 in the morning and provide guidance where necessary.

6.3.2.3 Role clarification



During the workshop: It was decided that every clinical facilitator would respond to discussions and queries from students that were related to the ENT health assessment for the period indicated. The researcher had the responsibility to prepare for and initiate the discussions during the time of the enactment (intervention). The clinical facilitator would create the WMGs and provide guidance to students where needed, while the researcher was responsible for creating the authentic, flexible and blended learning environment in which the integration of the theory and clinical practice of the ENT health assessment is enhanced.

The strategic session with the clinical facilitators created an opportunity to address issues that could surface during the planned enactment (intervention). This session ensured that each clinical facilitator was allocated a manageable WMG and that the roles and availability of the lecturers and clinical facilitators were clearly defined and understood.

It can be concluded that this session provided an agreed-upon clear, structural plan for the enactment (intervention), which could be presented to the students and lecturers and clinical facilitators collectively without eliciting any confusion.

6.4 MATERIALS USED DURING PRESENTATION OF THE WORKSHOP

The workshop was presented systematically using a PowerPoint presentation, as illustrated in Figure 6.3. During the workshop it was established that all students and lecturers and clinical facilitators who volunteered to be part of the study had downloaded the WhatsApp Messenger application on their mobile devices.

The figure displays a series of 21 PowerPoint slides from a workshop presentation. The slides are arranged in a grid and cover the following topics:

- Slide 1:** Welcome to WhatsApp! THE WORKSHOP 01 APRIL 2016. Form mobile messaging with all over the world.
- Slide 2:** OUTCOMES FOR THIS SESSION.
 - INTRODUCING THE TITLE
 - REVIEW OF RESEARCH PROCESS
 - THE PRINCIPLES IDENTIFIED
 - STATISTICS
 - ESTABLISHING WHATSAPP MESSENGER GROUPS
 - THE DO'S AND DON'T'S
- Slide 3:** WHAT IS THE STUDY ABOUT?
 - TITLE: THE AFFORDANCES OF MOBILE LEARNING FOR AN UNDERGRADUATE NURSING PROGRAM: A DESIGN BASED STUDY?
 - OBJECTIVES:
 - Phase 1: The exploration phase (situational analysis)
 - Explore and describe the parameters of students, lecturers and clinical facilitators on the integration of theory and practice of the health assessment of the head and neck within the Primary Health Care module through learning in an undergraduate nursing program at a HEC in the Western Cape.
 - Develop a plan (intervention) for the integration of theory and practice of the health assessment of the head and neck within the Primary Health Care module through learning in an undergraduate nursing program at a HEC in the Western Cape.
- Slide 4:** WHAT IS THE STUDY ABOUT?
 - Phase 2: The enactment phase
 - A. Implement the plan (intervention) to integrate theory and practice of the health assessment of the head and neck within the Primary Health Care module through learning in an undergraduate nursing program at a HEC in the Western Cape.
 - Phase 3: Reflection
 - A. Reflected on the experiences of students, lecturers and clinical facilitators on the integration of the new intervention, by means of diary and journal, which are used as a source of information, to inform a plan of action in the next iteration.
 - B. Reflected on the experiences of students, lecturers and clinical facilitators on the integration of the new intervention, by means of diary and journal, which are used as a source of information, to inform a plan of action in the next iteration.
- Slide 5:** WHAT IS WHATSAPP?
 - WhatsApp Messenger is a cross-platform mobile messaging application.
 - It allows exchange of messages without having to pay the cost of an SMS.
 - WhatsApp Messenger is available for iPhone, BlackBerry, Android, Windows Phone and Nokia.
 - WhatsApp Messenger is not limited to a type of mobile device, as long as you have a phone number.
 - WhatsApp Messenger uses internet data plan for email and web services.
 - There is no cost to message and data is bought with pre-paid or pay-as-you-go data available.
- Slide 6:** HOW POPULAR IS WHATSAPP?
 - Now serving 600,000,000 monthly active users. Yes, active and registered are very different types of numbers.
- Slide 7:** Number of monthly active WhatsApp users worldwide from April 2013 to February 2016 (in millions). (Bar chart showing growth from ~10M in April 2013 to ~1.5B in February 2016).
- Slide 8:** Selected emerging mobile markets with the highest WhatsApp popularity rate as of February 2016. (Bar chart showing rates for various countries).
- Slide 9:** WHO DISCOVERED WHATSAPP?
 - WhatsApp was founded in the heart of Silicon Valley.
 - What does the name mean? WhatsApp is a portmanteau of what's in and you didn't text it yet.
 - Why? An affordable alternative to an SMS.
 - Who? WhatsApp was founded by Jan Koum and Brian Acton, who spent several years building WhatsApp before going public.
- Slide 10:** FEATURES OF WHATSAPP THAT CAN BE USED
 - WhatsApp Messenger can be used for:
 - Send and receive messages
 - create groups
 - send each other unlimited images
 - send each other unlimited video
 - send each other unlimited audio media message
 - send each other unlimited documents
- Slide 11:** WHATSAPP MESSENGER EMOTICONS. (Image showing the WhatsApp interface with a selection of emojis).
- Slide 12:** DOCUMENT SHARING USING WHATSAPP
 - The latest release of WhatsApp has added the first stage of document sharing. The all-apple app (v2.12.40) introduces a new documents icon to the top-left attachments list, but for now the only type of document you can add is a PDF file. Both the sender and receiver must be on the same version of WhatsApp.
- Slide 13:** PRINCIPLES IDENTIFIED
- Slide 14:** PRINCIPLES / RULES FOR THE INTERVENTION. 1. INSTALLING WHATSAPP MESSENGER. (Image showing the WhatsApp app icon on a phone screen).
- Slide 15:** PRINCIPLES / RULES FOR THE INTERVENTION. 2. INSTALLING THE PHC CLINICAL GUIDE.
 - STEP 1: Go to Google Play Store
 - STEP 2: Open the search function
 - STEP 3: Type in "PHC Clinical Guide" and click INSTALL
- Slide 16:** PRINCIPLES / RULES FOR THE INTERVENTION. 3. DIVIDE INTO WHATSAPP GROUPS
 - 1. EACH STUDENT HAS BEEN ASSIGNED A CLINICAL FACILITATOR
 - 2. AT THIS STAGE YOU HAVE TO GO TO YOUR CLINICAL FACILITATOR TO BE ADDED INTO A GROUP
- Slide 17:** DIVISION OF LABOUR: WHO DOES WHAT!
 - Researcher: Initiate communication
 - Students: Respond to the communication! Be proactive to share an interesting case (communication becomes your online tutorial)
 - Lecturer and Clinical Facilitator: Review communication from students and guide where needed
- Slide 18:** REFERENCE LIST
 - Engeström, Y. (2008). Enriching activity theory without shortcuts. *Interacting with Computer*, 20, 256-259.
 - <https://www.whatsapp.com/>. Accessed 31 March 2016 @ 15H32
 - <https://www.whatsapp.com/about/>. Accessed 31 March 2016 @ 15H43
 - <http://appleinside.com/apple/ios/ios-app-store/face-it-apple-introduce-is-whatsapp-messaging>. Accessed 31 March 2016 @ 14H15
 - <https://www.whatsapp.com/faq/en/iphone/20150301>. Accessed 31 March 2016 @ 17H00
- Slide 19:** PRINCIPLES / RULES FOR THE INTERVENTION. 3. DIVIDE INTO WHATSAPP GROUPS. (Continuation of slide 16).
- Slide 20:** DIVISION OF LABOUR: WHO DOES WHAT! (Continuation of slide 17).
- Slide 21:** REFERENCE LIST (Continuation of slide 18).

Figure 6.4: PowerPoint presentation of the workshop

During the workshop, students and lecturers and clinical facilitators once again confirmed that WhatsApp Messenger was the cheapest and most effective form of online communication for the

study. Those who needed assistance to download the WhatsApp Messenger application on their mobile devices were provided with assistance during the workshop, as illustrated in Figures 6.5–6.8.



Figure 6.5: Participants at the workshop



Figure 6.6: Participant displaying her mobile devices



Figure 6.7: Participants displaying their personal mobile devices



Figure 6.8: WhatsApp Messenger download viewed at the workshop

6.5 THE WORKSHOP ETHICS

At the start of the workshop, the focus was on ensuring that all ethical research principles were adhered to. Participants were therefore informed about the purpose and aims of the research and all the relevant written permissions were obtained.

6.5.1 Written informed consent

Written informed consent was obtained from students and lecturers and clinical facilitators prior to their participation in the enactment (intervention), which was to commence after the purpose of the study and the expectations of the researcher were explained. Every participant received a hard copy of the participant information form (Annexure 7) and the consent form (Annexure 11). The participant information form explained the title, purpose, guidelines for participation in the study, ethical considerations, and contact details of the researcher, research supervisor and dean of the faculty should there be any questions regarding the research after the information session.

6.5.2 Voluntary participation

Students and lecturers and clinical facilitators were informed that their participation in the study would be voluntary. They were informed that they could withdraw from the study at any stage and it was emphasised that there would be no negative consequence or impact on their studies or working relationship if they decided to withdraw from the study. Each participant voluntarily completed the consent form (Annexure 5). The researcher informed participants that there were no direct or indirect benefits for participating in the study apart from technical guidance and assistance while using mobile devices optimally to enhance their learning journey.

6.5.3 Anonymity and confidentiality

As no personally identifiable information was obtained and each participant was assigned a reference number during the data collection process of the study, anonymity of participants was assured. Students and lecturers and clinical facilitators did, however, have to give written permission for the use of their mobile contact numbers for the duration of the study. After the study was completed, all numbers were removed by the clinical facilitator who created the WMG and this was assured by the researcher. Participants were informed that all data collected would be kept confidential and secure in a locked cupboard in the office of the researcher. The researcher, research supervisors and independent coder were the only individuals who had access to any information relating to the study. Confidentiality and anonymity of all data relating to the study participants was assured through the use of coding for reflections, transcripts and digital recordings and by ensuring that the data would be kept in a safe place under lock and key for five years. Participants were informed that their personal data will remain confidential and

anonymous and that all information gathered will be for the purpose of this study, related conference presentations and publications in accredited journals only.

6.5.4 Privacy

Participants who consented to participate in the study gave written informed consent to have their cell phone numbers be made available to the researcher and the clinical facilitators in this project. The researcher undertook to not share the cell phone numbers with anyone apart from the responsible clinical facilitator of the individual student and the research supervisor. Participants in the study had to give written consent for allowing their pictures to be taken during the workshop (Annexure 8.3). They were informed that their pictures would remain confidential and anonymous and that it would only be used for the purpose of this study, related conference presentations and publications in accredited journals.

6.6 SUMMARY

This chapter describes the development of a solution to the identified problem which was to integrate theory and clinical practice of the ENT health assessment through m-learning. The enactment (intervention) plan to enhance the integration of the theory and clinical practice of the ENT health assessment was outlined.

A workshop with students, also attended by lecturers and clinical facilitators, provided a platform to ensure that every participant in the study was informed of what the planned enactment was about. The workshop provided an opportunity to summarise the research process and to indicate the scientific research process that would be followed to enable the development of the enactment.

Chapter 7 provides a description of the enactment of the three iterations of the design framework, followed by the reflective practice of students and lectures and clinical facilitators to inform the subsequent adjustments to the iterations. A total of three iterative design frameworks were planned for the enactment phase to enhance ITCP of the ENT health assessment in the PCCSM.

7 CHAPTER: THE ENACTMENT AND REFLECTIONS OF THE THREE ITERATIONS IN THE ENACTMENT



“Design is not just what it looks like and feels like. Design is how it works.”

Steve Jobs

7.1 INTRODUCTION

This chapter addresses the implementation of the planned intervention and reflections on the enactment, with the objectives of:

- implementing the plan developed for the intervention (enactment) to integrate the theory and clinical practice (ITCP) of the ENT health assessment in the primary care and clinical skills module (PCCSM) through m-learning (Phase 2, Objective 4); and
- reflecting on the implementation of the enactment to integrate theory and clinical practice of the ENT health assessment in the PCCSM through m-learning (Phase 3, Objective 5).

In Chapter 6, the plan for the enactment (according to the Integrative Learning Design Framework (ILDF) of Dabbagh and Bannan-Ritland, 2005) in an online learning environment was outlined. Specific activities for the plan included mapping information gathered on pedagogical models, while considering the instructional characteristics of the selected pedagogical models (see draft design principles Table 6. 1). These characteristics were aligned in the specific plan (instructional strategy) with the selected pedagogical models (affordances of WhatsApp). The enactment of the instructional strategy (plan) used the features of the technological delivery system, identified as WhatsApp Messenger (Dabbagh & Bannan-Ritland, 2005). The enactment was done within Engeström’s (2008) third-generation Activity Theory, that was part of the theoretical departure of the enactment (Behrend, 2014), outlined in Chapter

1. The specific activities in this chapter focus **on how** to “*enact the instructional strategy by using the features of technological delivery system*” (Dabbagh & Bannan-Ritland, 2005). Objective 4 (the enactment) and Objective 5 (the reflection) took place in sequence (see Figure 7.1), as reflections after each **iterative cycle** informed a next iterative cycle (Objective 5).

During the enactment, three iterative cycles were completed after which final design-based principles were formulated.

Each of the three iterative cycles comprised the following steps:

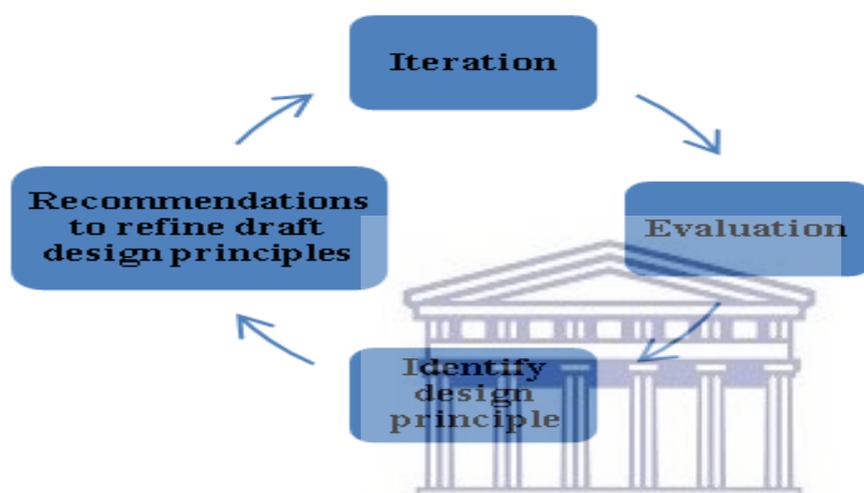


Figure 7.1 Illustration of one iterative cycle in the enactment (intervention)

This study applied the plan during three iterative cycles during the enactment. Refinements to the draft design principles were then made by participants after each of the three iterative cycles (Figure 7.2). *Recommendations to refine the identified design principles were then made for the next iteration.*

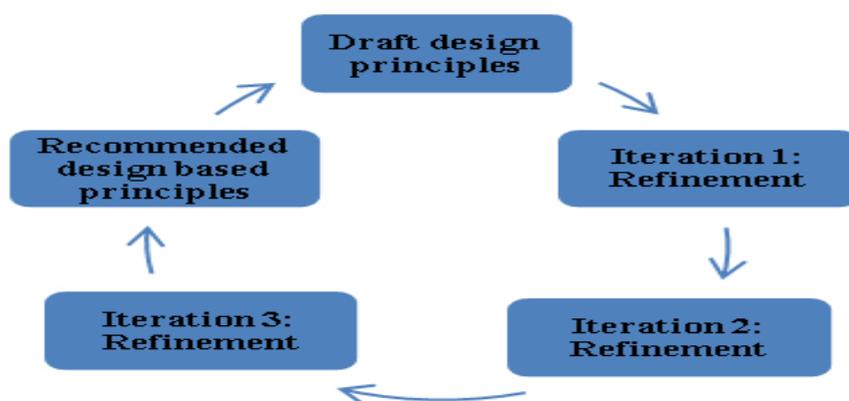


Figure 7.2: Refinements made after each of the three iterative cycles

The affordances identified in the study were applied to all three iterative cycles. This chapter will be presented as follows:

- Activity Theory (AT): Theoretical framework for the enactment
- The three iterations in the enactment
- Reflecting electronically following the iterations

For purposes of the discussion, Chapter 7 will describe the first iteration cycle and Chapter 8 will then continue to describe Iterations 2 and 3.

7.2 ACTIVITY THEORY SYSTEM (AT): THEORETICAL FRAMEWORK FOR THE ENACTMENT

Engeström's (2008) third-generation Activity Theory (AT) system, situated within the socio-cultural theory, is the theoretical departure of the enactment (Behrend, 2014). The AT system (Figure 7.3) served as the framework for analysing how the study participants used the mediating artefact to achieve the specific objectives and outcomes of the study. The theory provided a structured framework to analyse the socio-cultural influences of rules, community and the division of labour within the activity system. The AT thus served as the framework for the implementation of the activities during the three iterative cycles of the enactment phase, as described in Chapter 1.

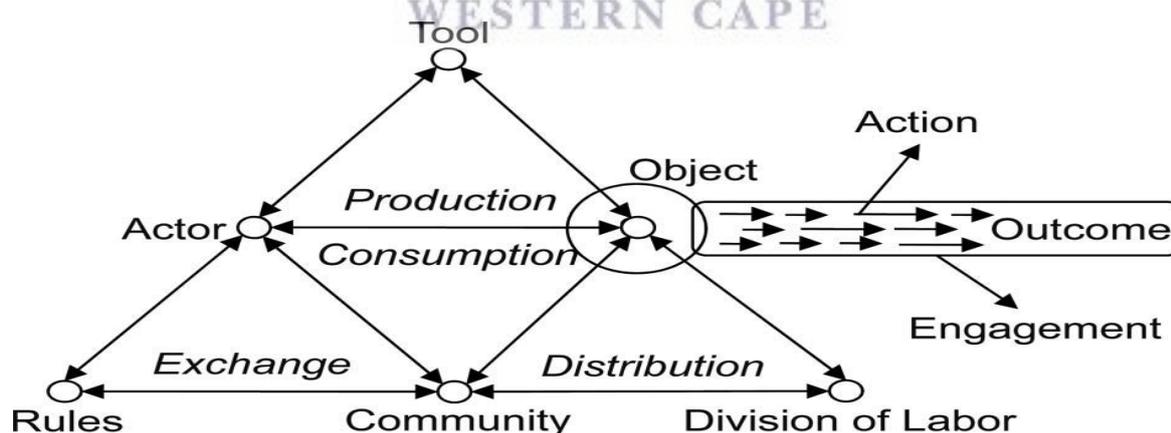


Figure 7.3: Complex structure of the Activity Theory (AT) System (Engeström, 1999, based on Engeström 1987)

7.2.1 Mediating artefacts

The mediating artefact was the mobile device, the tool used during the intervention in the study to enhance ITCP of the ENT health assessment in the PCCSM during the 3rd year undergraduate nursing programme.

7.2.2 Subject

The researcher was the actor who, during the ENT health assessments, communicated activities to the third-year community health students in clinical practice and to the lecturers and clinical facilitators who facilitated the health assessment in the WMGs. The actor, a nurse educator registered with the South African Nursing Council, had an interest in mobile technology in the teaching environment of a higher education institution, with three published articles on m-learning in peer reviewed journals. The actor was a third-year community health nurse educator who had more than 12 years of nursing education experience in the field of community health nursing.

The actor presented a theory session in class, on-campus, using PowerPoint slides to prepare students for their clinical practice during the following week. She also initiated activities within the WMGs to stimulate discussion and responses focused on the health assessment of the area that was discussed during the theory session in class.

For the intervention, the actor exchanged the rules with the community (students, lecturers and clinical facilitators) and facilitated the intervention using the WhatsApp Messenger application as the tool. The actor had to ensure that the activities were prepared in advance in order to communicate them at the agreed-upon time while students were within clinical practice. She furthermore had to ensure that there was an exchange of the rules for the WhatsApp Messenger intervention within the community.

7.2.3 The community

Participants

The research participants in Phase 1 was described under Section 4.2.1 (Chapter 4) and point 5.2 (Chapter 5) that took part in Objectives 1 and 2 to develop a plan. The research participants in Phase 1 was described under Point 2.5.2.1 (Objective 1) and Point 2.5.3.1 (Objective 2) that took part in 2013. A similar target group implemented the developed plan. The research population

and sample (community) included 102 third-year undergraduate nursing students (n=102) registered for the 2016 semester one PCCSM and five lecturers and clinical facilitators (n=5) involved in facilitating the module. Participants who volunteered to take part in the enactment were included in the sample. Quantitative and qualitative data was collected from students, lecturers and clinical facilitators in 2013. Students, lecturers and clinical facilitators participated in the online survey, focus groups, ISSIs and the conceptualisation session in 2013. In semester one in 2016, the planned intervention (enactment) was implemented. The study participants were thus 2016 Semester One third-year undergraduate nursing students registered for the PCCSM, of whom 77 (75.49%) were female and 25 (24.5%) were male (n=102). The lecturers and clinical facilitators who facilitated the PCCSM and participated in the enactment comprised four (80.0%) females and one (20.0%) male (n=5). None of the participating students repeated this module.

The clinical facilitators were mainly females between the ages of 26 years to more than 50 years and each had at least three years of experience in the field of teaching the ENT health assessment to undergraduate nursing students.

Roles

The community had the responsibility to engage in the ENT health assessment under the guidance of the actor. It was also the responsibility of the community to adhere to the rules of engagement while participating in the WhatsApp Messenger intervention with the object of enhancing the integration of the theory and clinical practice of the ENT health assessment. The *actor* had to ensure that there was an exchange of the rules for the WhatsApp Messenger intervention within the community. The *students* were expected to participate in the activities provided while they were in clinical practice. The activities were based on the theory session received before students went into their clinical practice areas. The role of the *clinical facilitators* was to guide the students while they completed the activities related to the ENT health assessment communicated by the actor. Students were also supported by *nurse educators* (registered nurses) while in clinical practice.

Data collection after each of the three iterations

Firstly, descriptive qualitative data was collected from students, lecturers and clinical facilitators participating in the m-learning intervention through electronic reflections at the end of every

iterative cycle. Electronic reflections were submitted after each of the three iterations by students (n=102) and clinical facilitators (n=3). Two of the clinical facilitators did not submit electronic reflections.

The reflections were supported by one focus group with students and one focus group with lecturers and clinical facilitators at times convenient for both the participants and the actor (researcher). The purpose of the focus groups was to validate the data collected through electronic reflections. They therefore served as a form of cross-verification, ensuring confirmation and completeness of the research findings (Breitmayer, Ayres & Knafl, 1993). One clinical facilitator (n=1) volunteered to participate in the enactment but did not participate in the three iterations other than to create the WMG for the clinical facilities and students assigned for clinical teaching. One lecturer/clinical facilitator volunteered to participate in the enactment but withdrew from the study before the first iteration commenced. The researcher was thus assisted during the intervention by three clinical facilitators who were very involved with every iteration and submission of the reflections.

Data gathering and analysis

The electronic reflections received from participants and the verbatim transcriptions of the focus groups held with the students, lecturers and clinical facilitators were thematically divided into themes and sub-themes using Tesch's (1990) method of data analysis. The electronic reflections and transcriptions of the focus group sessions were only viewed by the researcher, research supervisors and the independent coder to ensure confidentiality and anonymity of all data related to the study participants. Confidentiality and anonymity were further assured by using coding for transcripts and digital recordings and by keeping the data in a tamper-proof cabinet. Data files were protected with a password when stored on the computer of the researcher. Participants were requested to read and verify the transcribed focus groups for correctness before data was used in the study. On completion of the researchers' data analysis, an independent coder reviewed the data analysis in order to confirm the themes and sub-themes identified by the researcher. The results of every theme and sub-themes identified were presented in the form of a discussion of the themes and relevant sub-themes identified, supported by extractions of phrases from participants and relevant literature to contextualise the findings (Polit & Beck, 2018). All participants were informed that the results of the study will be disseminated through

presentations at regional, national and international conferences and publications in peer reviewed journals.

The themes and sub-themes from the electronic reflections confirmed the findings of the data analysis of the focus group with students, lecturers and clinical facilitators. Duplication was prevented by only including quotations from matching themes and sub-themes from the focus group to strengthen the research findings. For the purposes of this study, the quotations extracted from the qualitative data collected for the student focus groups (SFGs) will indicate e.g. “Student Focus Group Participant 2” but abbreviated as “SFGP 2”; “Student Reflection Participant 3” but abbreviated as “SRP 3”; the focus group with lectures and clinical facilitators will indicate e.g. “Educators Focus Group Participant 1” but abbreviated as “EFGP 1”; Clinical Facilitator Reflection referred to as “Clinical Facilitators Reflection Participant 4” but abbreviated as “CFP 4”; etc. In this study, students refer to the nursing personnel at clinical facilities as staff.

The structured framework of the AT system, including the community, object, tool, rules of engagement and the division of labour, was linked to the affordances of Bower (2008) for the enactment (intervention) (identified from Tables 6.1 & 6.2 in Chapter 6) during the three iterative cycles. The four higher-order functions of the AT system, referred to as production, distribution, exchange and consumption, are embedded within this AT model. The community could be linked to affordances of Bower (2008), as indicated by the example in Table 7.1.

Table 7.1: Example of community linked to affordances of Bower (2008)

AFFORDANCES	THE COMMUNITY
<i>Permission-ability</i>	Permission obtained from students and educators to participate in the enactment (intervention) had the capacity to allow access to reading, uploading, viewing and administering of information between students and educators (Chapter 6: 6.5).

7.2.4 The object

The object of this study was the integration of theory and clinical practice of the ear, nose and throat health assessment in the primary care and clinical skills module through m-learning (Objective 4). A plan was developed for this enactment (intervention) that included the draft

design-based principles (Table 6.1). The *production* of design principles, which followed the three iterative cycles to refine the draft design principles (Table 6.1), are recommendations for lecturers and clinical facilitators who plan a m-learning enactment (intervention) (Objective 6). Similar to other studies, this study aimed to investigate the use of emerging technologies, specifically m-learning, to improve student learning as this mode of learning was becoming more prolific in higher education (Bozalek *et al.*, 2014; Pimmer & Pachler, 2014; Veletsianos, 2010). The use of technology, such as mobile devices, has permeated our daily lives and provides inexhaustible access to real-time communication and information. Communication could be linked with the affordances of Bower (2008) (Table 7.2).

Table 7.2: The object linked to affordances of Bower (2008)

AFFORDANCES	THE OBJECT
<i>Write-ability, readability, view-ability, speak-ability and listen-ability</i>	WhatsApp Messenger, a method of communication providing services such as text messages, pictures, videos and voice notes, provide opportunities for visualisation and interaction with learning content by using personal mobile devices (BYOD) (Table 6.1: CH 3: DDP 4 & 12; CH 5: DDP 3 & 4).

A study at the Faculty of Communication and Information Science at the National University of Science and Technology in Bulawayo, Zimbabwe, investigated and confirmed the importance of mobile technology in undergraduate programmes through the use of mobile phones (Dewah & Mutula, 2013).

7.2.5 The tool

The tool for this study was WhatsApp Messenger application on any mobile phone that could access the Internet (and had the functionality to download the WhatsApp Messenger application) to enable communication with students and enhance the integration of their theory and clinical practice of the ENT health assessment in the PCCSM through m-learning. The potential for using WhatsApp Messenger as an instant messaging tool was particularly pertinent in resource-poor contexts (Yeboah & Ewur, 2014), such as a previously disadvantaged university setting. Owing to affordability and accessibility, instant messaging could potentially be used in higher education for both formal and informal learning, particularly, as mentioned, in resource-poor contexts such as the HEI where this study was undertaken (Bere, 2012; Church & De Oliveira, 2013; Ng'ambi, Brown, Bozalek, Gachago & Wood, 2016). Through research it has been

established that the use of mobile devices for m-learning initiatives could provide diversity in the teaching and learning platform in the facilitation of the ENT health assessment. The affordances of Bower (2008) could be linked with the tool, as seen in the example in Table 7.3.

Table 7.3: The tool linked to affordances of Bower (2008)

AFFORDANCES	THE TOOL
<i>Link-ability</i>	WhatsApp Messenger provides a link or connection between students and educators and should be used in a m-learning enactment (intervention) as it allows for immediate responses in real-time (Table 6.1: CH 4: DDP 11 & 12; CH 5: DDP 5, 6 & 7).
<i>Focus-ability`</i>	WhatsApp Messenger provides a link or connection between students and educators and should be used in a m-learning enactment (intervention) as it allows for immediate responses in “real-time” (Table 6.1: CH 4: DDP 11 & 12; CH 5: DDP 5, 6 & 7).

7.2.6 The rules of engagement

To be a participant in the study, the community (students, lecturers and clinical facilitators):

- were in possession of a personal mobile device;
- were prepared to use their personal mobile device as a tool to participate in the study;
- had access to a reliable Internet connection off-campus; and
- were registered for the PCCSM, a semester module.

Every participant would have had to engage with the information communicated in the WMG by their peers at the clinical facility where they were placed. After their deliberations, they would have had to submit one collective response using the name of their clinical facility to identify them in the WMG. Every student participant was informed that they would only be allowed to use their mobile devices during their tea and lunch break to participate in the WhatsApp Messenger activities while within clinical facilities to ensure that they do not contravene the cell phone policy of the clinical facility. On completion of the theory session and their clinical practice on the ENT health assessment, each participant had to submit an individual electronic reflection. Rules of engagement also linked with affordances (Bower, 2008), of which an example is outlined in Table 7.4.

Table 7.4: Rules of engagement linked to affordances of Bower (2008)

AFFORDANCES	RULES OF ENGAGEMENT
<i>Reliability</i>	All students and educators had to follow the same rules of engagement to support reliability (Chapter 6: 6.5).

7.2.7 The division of labour: “Who does what?”

During the workshop, the community was informed about their individual roles, establishing “Who does what?” With the division of labour the student (community) had to *engage* in the activity communicated by the actor, and the clinical facilitator (community) had to view and respond to the communication received from the students within the WMG where needed (*distribution; exchange*). During the division of labour, the community was made aware of the affordances needed for a successful enactment (intervention) (Table 7.5). M-learning involves a focus on the affordances (Bower, 2008) of the device and a focus on learning at any time or any place.

Table 7.5: Affordances identified for the division of labour (Bower, 2008)

AFFORDANCES	DIVISION OF LABOUR – DISTRIBUTION
<i>Accessibility</i>	The educator had to be available on the WMG while the students were in clinical practice (08h30–16h00) to ensure accessibility (Chapter 6: Table 6.2).
<i>Share-ability</i>	The use of a smartphone, with its technological advances, is a mode of communication that enhances ITCP. It provides support on a one-on-one, one-to-many or many-to-many basis, allowing students and educators to share contributions and collaborate with one another, e.g. by using WhatsApp Messenger (Table 6.1: CH 3: DDP 1; CH 4: DDP 1, 10 & 14; CH 5: DDP 1 & 2).

7.2.8 Outcome

The outcome of this m-learning intervention is ITCP of the ENT health assessment through m-learning. An evaluation of the enactment using the AT of Engeström (2008) will be integrated with the evaluations (in the form of reflections) after each iterative cycle.

7.3 OVERVIEW OF THE THREE ITERATIVE CYCLES

Bannan-Ritland (2003) indicates that the ILDF observes an intervention as a socially constructed object that must be systematically articulated and revised over a number of cycles or iterations, with the purpose of testing the research assumptions. The enactment phase thus included the initial plan developed and intervention designed after the exploration phase. The subsequent adjustments to the plan developed during the intervention was purposed towards developing a more detailed plan and were influenced by the reflections received on the impact of the intervention on completion of each of the three iterations. As stated earlier, this study applied three iterative cycles during the enactment, and the draft principles in the plan developed in Chapter 6 were refined and adjusted after every iterative cycle. The affordances identified in the study were applied to the three iterative cycles (Figure 7.4).

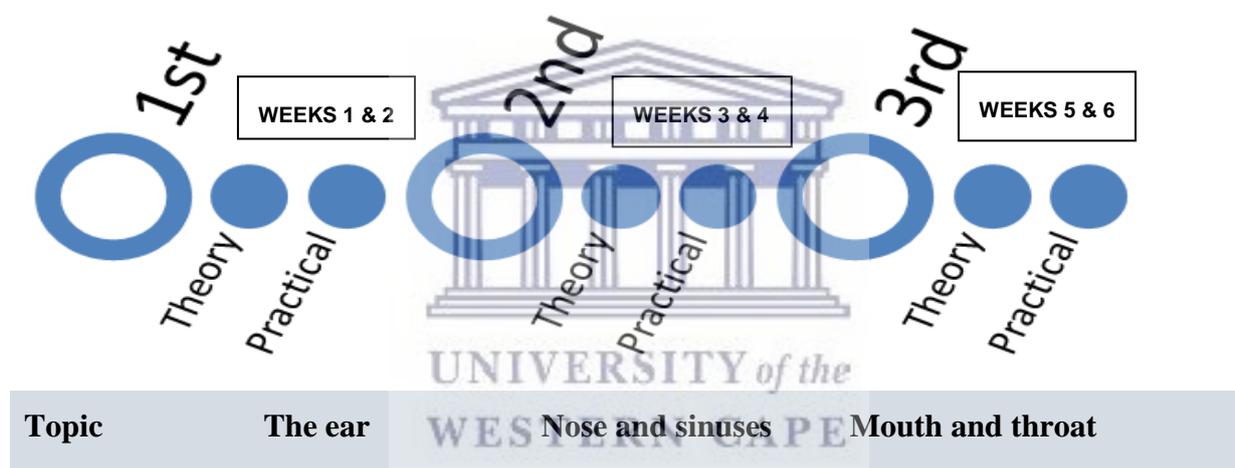


Figure 7.4: Process of the three iterative cycles

The following process was followed during each of the iterations:

- Each of the three iterations started with a theory session in class before students went into their clinical placement facilities.
- *Each of the iterations was completed over a two-week period* through engagement with students to enhance their integration of the theory and clinical practice of the ENT health assessment using WhatsApp Messenger as a mode of communication. Iterations included the draft design principles, as pointed out in Table 6.1.
- Findings from the reflections of the iterations were coded in themes and sub-themes (*consumption*).

- Conclusions were drawn from findings in each of the iterations, from which draft design principles were refined.
- Draft design principles that were refined for implementation in the next iterative cycle are colour coded in orange (1st iteration), green (2nd iteration) and blue (third iteration) (*consumption*). Where appropriate, the aspect of Engeström's (2008) AT was indicated in a blue block under the design principle.
- Each of the three iterations included the content given and the evaluations of the iteration.
- The evaluation of each iteration is followed by conclusions and the design principles used.
- Each of the three iterations is followed by the refined design-based principles, as indicated by the colour coding.

During the first week of the iteration, students received a theory session in class on the section of the ENT health assessment that they would deal with in clinical practice the next week. In the second week of the iteration, students received tasks in clinical practice to enhance the integration of their theory and clinical practice, as illustrated in Figure 7.4. The iterative cycles provided the researcher the opportunity to adjust the tasks in order to meet the learning needs of the students, as indicated in the online reflections received after every iterative cycle. The main outcomes of the three iterations, according to the PCCSM, were for students to:

- demonstrate an understanding of conducting a history taking, specific to certain systems of the body;
- demonstrate an understanding of the techniques involved in conducting a physical assessment;
- demonstrate the ability to identify the difference between normal and abnormal conditions;
- demonstrate an understanding of the management objectives for common conditions; and
- display a basic understanding of the treatment protocols.

There were two student groups registered for the 2016 PCCSM (semester two) that participated in the study. Their theory and clinical practice sessions were scheduled as indicated in Table 7.6.

Table 7.6: Allocation of theory sessions and clinical practice days

Group	Theory Class Session	Clinical Practice Days	Group	Theory Class Session	Clinical Practice Days
Group 1	Thursday	Monday and Tuesday	Group 2	Monday	Wednesday and Thursday

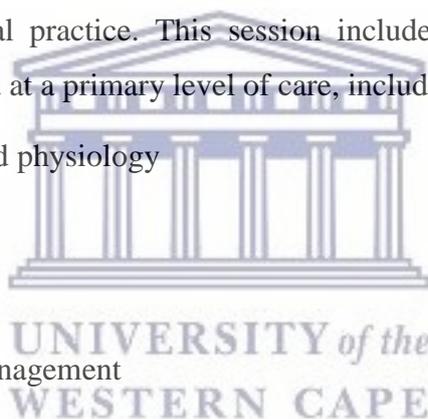
7.4 THE FIRST ITERATION: THE EAR

The first iteration is now discussed, whereas the 2nd and 3rd will be addressed in Chapter 8.

7.4.1 Theory session: Week 1

Students first received a theory session in class on the ear via PowerPoint slides (Figure 7.5) before they went into clinical practice. This session included an overview of the common conditions of the ear, managed at a primary level of care, including:

- Review of anatomy and physiology
- History taking
- Diagnosis
- Drug and non-drug management
- Health education and referral



At the end of the session, students were reminded of the planned interaction using WhatsApp Messenger that would start the following Monday while they were in clinical practice. The logistics of the interaction was discussed during the workshop with students and educators.

The figure displays a series of 20 educational slides for a theory session on ear health assessment, arranged in a grid. The slides cover various topics including:

- Slide 1:** Introduction to the Health Assessment of the Ear. Class 1: 14 April 2016, Class 2: 18 April 2016.
- Slide 2:** Main Outcomes for this Session. At the end of this session you have to be able to:
 - Demonstrate an understanding of conducting a history taking, specific to certain systems of the body.
 - Demonstrate an understanding of the techniques involved of conducting a physical assessment.
 - Demonstrate the ability to identify the difference between normal and abnormal conditions.
 - Demonstrate an understanding of the management objectives for common conditions.
 - Display a basic understanding of the Treatment Protocols.
- Slide 3:** Specific Learning Outcomes for the Ear. At the end of this session you have to be able to demonstrate an understanding of:
 - Anatomy and physiology of the ear
 - Principles of examination of the ear
 - How to gather information: subjective/objective
 - Examination techniques related to the ear
 - Clinical signs/symptoms of common conditions of the ear
 - Management objectives
 - Treatment (Mobile application - EDU)
 - Prevention and Health Education
- Slide 4:** Review: Basic Anatomy of the Ear. Includes an anatomical diagram of the ear.
- Slide 5:** Review of the Anatomy and Physiology of the Ear using Online Resources. Lists various online resources for anatomy and physiology.
- Slide 6:** Case Study. An 21 year old student presents at the health facility with a complaint of "severe pain in his left ear for the past 3 days. He is unable to think and have an important test in 5 days. His vital signs were as follows: Temperature 37.8°C, pulse 70 bpm, respiration 22 bpm and Bp 135/82 mmHg
- Slide 7:** Case Study Summary. Subjective data: Pain, swollen, hot, red, tender, purulent discharge, etc. Objective data: Can be seen, heard, felt, smelled, physical examination, etc. Vital signs: Temperature 37.8°C, pulse 70 bpm, respiration 22 bpm and Bp 135/82 mmHg
- Slide 8:** History Taking. Ear Pain: Pain in the ear can have many causes. Some of these are infection, some are not infection. Any swelling - (describe the location and the character for e.g. dull, red, shiny, moist, crusting, any accompanying cold symptoms or sore throat, any problems with vision or teeth. Any previous ear trauma. What do you note to relieve the pain. Any ear infections: how frequent, how they have been treated. Discharge from ears - pur or blood, colour or discharge. Any hearing loss - ear not any middle hearing. Tinnitus - any ringing, buzzing, or hissing in your ears. Any signs of vertigo - room spinning, unsteady.
- Slide 9:** Principles of the Examination of the Ear. Examination of the ear includes inspection of the:
 - Auricle and mastoid bone
 - External ear canal and tympanic membrane
 Inspect auricle/pinna and mastoid bone for the following:
 - Size and shape: it must be of equal size and similar appearance.
 - Position: pinna must be aligned with corner of the eye.
 - Scars and discolouration: the skin must be smooth and without nodules.
 - Mastoid bone: assess for redness and swelling.
- Slide 10:** Principles of the Examination of the Ear. Examination of the ear includes the palpation of:
 - Palpate external ear for the following: it must be non tender. A painful auricle and tragus is associated with otitis externa and tenderness behind the ear is associated with otitis media.
 - Mastoid process: assess if there is pain on palpation. It is associated with mastoiditis.
- Slide 11:** Examination of the Ear. Clinical Inspection. Page 11. Skills Laboratory.
- Slide 12:** Discussion on Common Conditions Managed at PHC. Otitis Externa, Otitis Media, Acute, Otitis Media, Chronic.
- Slide 13:** Examination Techniques. Inspection, Palpation.
- Slide 14:** Otitis Media. Associated with:
 - Fluid accumulation in the middle ear
 - Signs and symptoms of an ear infection, e.g.
 - Bulging tympanic membrane
 - Pain
 - A purulent discharge
- Slide 15:** Otitis Media: Middle Ear Infection. Includes a diagram of the middle ear.
- Slide 16:** Management Objectives for Common Conditions Identified.
 - To treat the infection effectively
 - To emphasize the importance of completing treatment
 - To prevent cross-infection
 - To give health education to support and improve the immune system focusing on: diet, exercising, vitamin supplements, avoid excessive sun exposure, etc.
- Slide 17:** References. Lists various references including textbooks and online resources.
- Slide 18:** Description and Management. South Africa. Department of Health. PHC Clinical Guide - Mobile Application. Ear, Nose and Throat.
- Slide 19:** Step by Step Navigation of the PHC Clinical Guide App for the Ear. Includes a screenshot of the app interface.
- Slide 20:** Step by Step Navigation of the PHC Clinical Guide App for the Ear. Includes another screenshot of the app interface.
- Slide 21:** Questions. A green circle with a white question mark.

Figure 7.5: Theory session: The ear

7.4.2 Clinical practice session: Week 2

On Monday, week two, the WhatsApp Messenger communication was initiated with the first group in clinical support practice. During the workshop, in preparation for the intervention, it was agreed that the first activity would be communicated by 10h00 in the morning. The first m-learning iteration using WhatsApp Messenger was communicated to students with the instruction to

review the anatomy of the ear, as shown in Figure 7.6. Students were requested to respond with answers within an hour in order to demonstrate their knowledge of the anatomy of the ear.

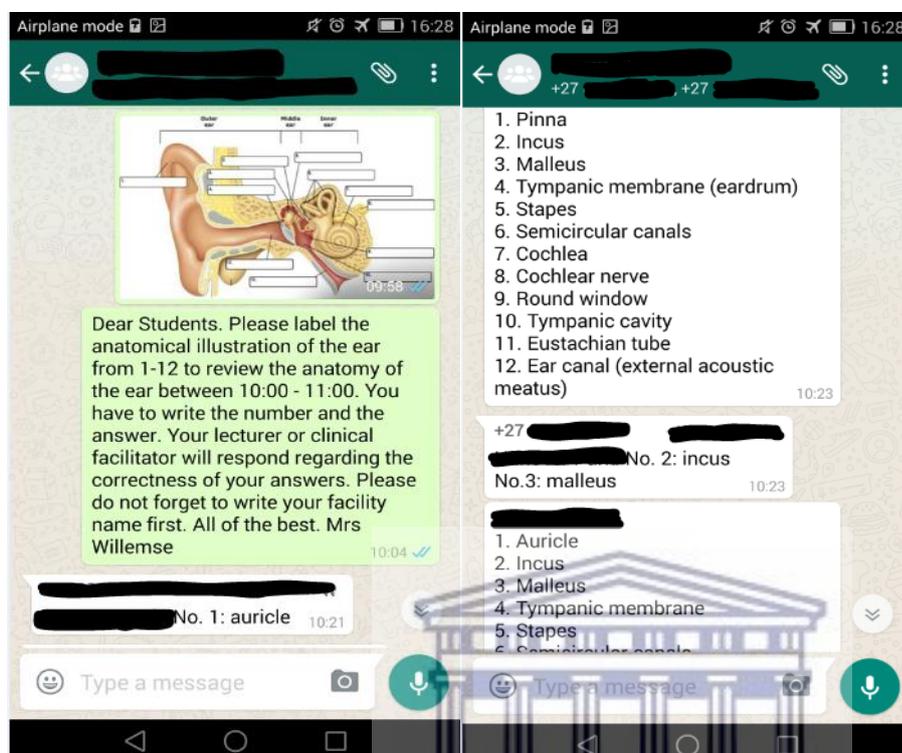


Figure 7.6: Instruction and responses: Review anatomy of the ear

Students responded to the activity with the name of their clinical facility group, created during the workshop. This allowed the clinical facilitator and the researcher to determine which students (grouped together in the same WMG) from which facilities were responding. Some groups responded within the allocated time, while others responded during the course of the day. At this stage, most facility groups participated in the activity. Three of the clinical facilitators as well as the researcher quickly acknowledged the responses received from the students.

On the same day, on completion of the review of the ear's anatomy, students were requested to produce a one to three-minute video (Figure 7.7) to demonstrate the techniques of examining the ear. There was a request that only one video should be produced per clinical facility and expectations for the task were clarified within the group.

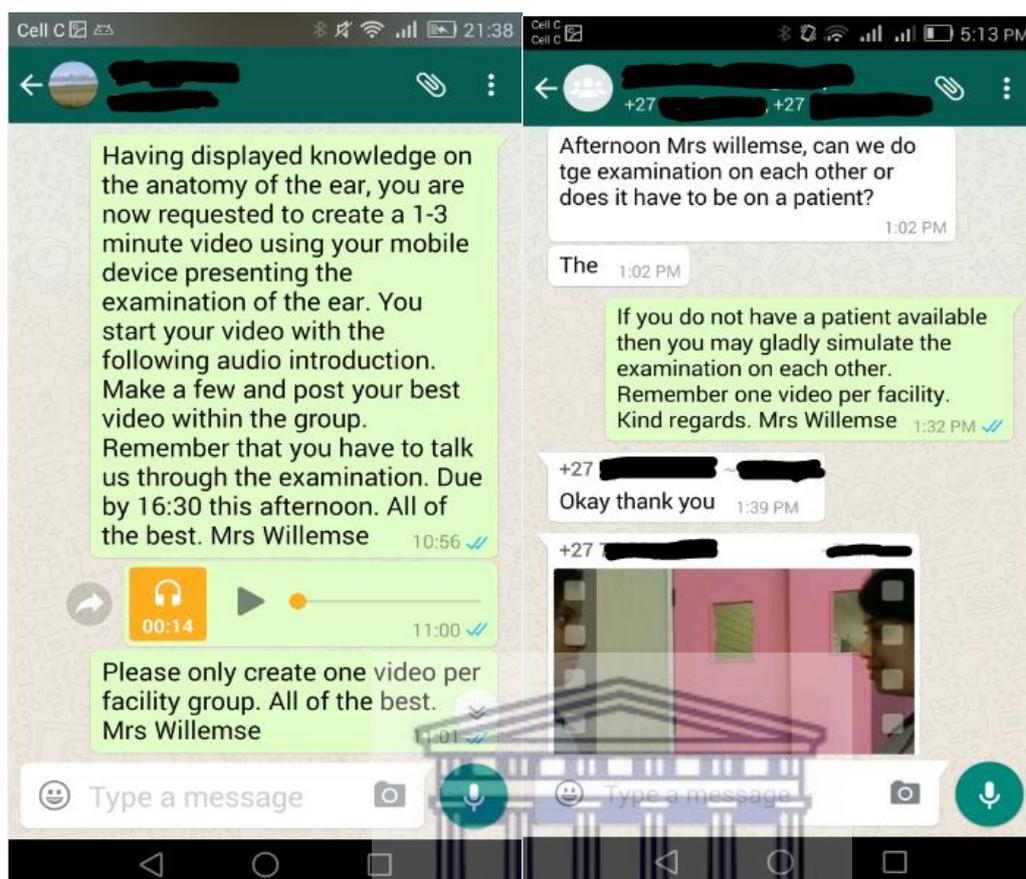


Figure 7.7: Instruction and videos produced on the examination techniques

As the researcher only had permission to approach patients to participate in the study at two Western Cape Department of Health Facilities (Annexure 6), students were allowed to demonstrate the task on each other (e.g. a simulated examination procedure that was recorded) if they were not doing their clinical practice at either of these two facilities. Submission of the videos was acknowledged by the clinical facilitators and the researcher, and the techniques that students demonstrated were reviewed for correctness. The videos had to be submitted by 16h30 on the day, but some videos were submitted much later or the next day due to the challenges identified. The videos were stored in Google Drive and could possibly be used as a teaching and learning tool where students would be able to review and write a reflection on the examination techniques of the ENT health assessment. The following day, Tuesday, a new activity was communicated to students using WhatsApp Messenger as an extension of the activities completed the previous day. Students were asked to collate a case study of an actual case, related to the management of a condition of the ear, which was managed within the clinical facility. Figure 7.8 depicts the instructions for this task.

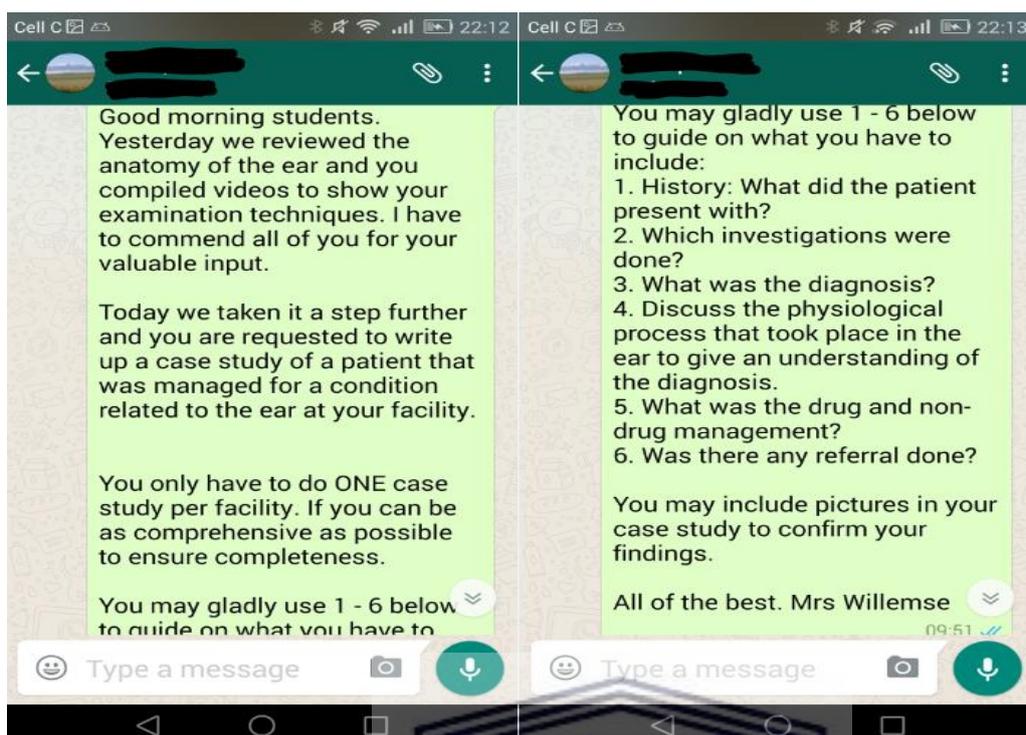


Figure 7.8: A guide on how to complete a case study

No time frame was given for submission and students completed the case study and submitted it into the WMG once it was completed. Students' responses are illustrated in the extract in Figure 7.9.

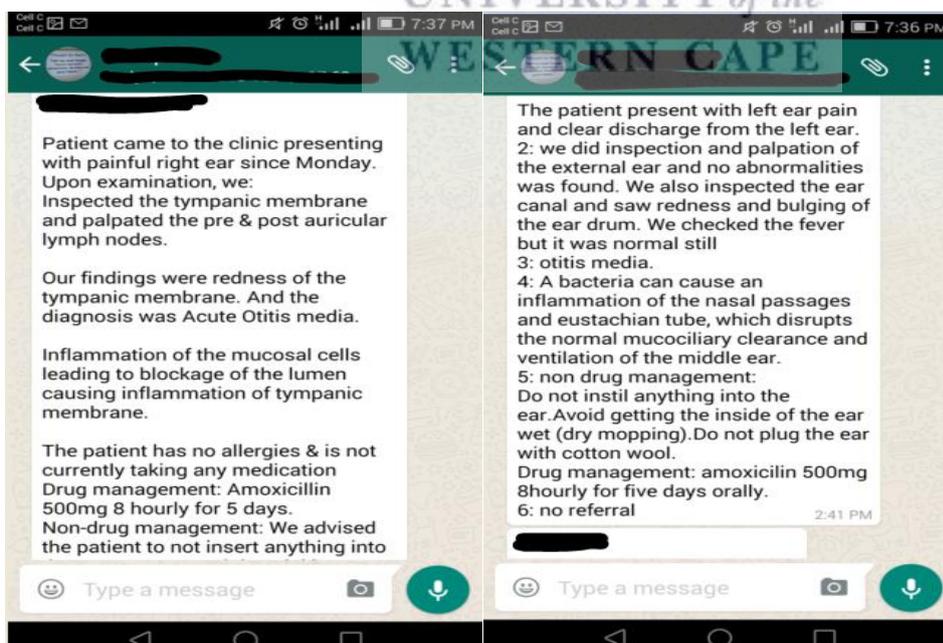


Figure 7.9: Presentation of a case study

Every interaction within the WMG with students who were within clinical practice on the Monday and Tuesday was duplicated with the students who were in clinical practice on the Wednesday and Thursday. No changes were made to any of the activities during the first iteration with the second group of students to ensure that this groups' experience of the activities was not compromised and to enhance the integration of their theory and clinical practice of the ear. The Wednesday/Thursday group of students had their own WMGs with their clinical facilitators and they could thus not view the communication of activities and the responses that took place on Monday and Tuesday.

7.5 REFLECTION AFTER THE FIRST ITERATION

The students' electronic reflections and the verbatim transcriptions of the focus group were collectively analysed. Eight main themes and a number of sub-themes were identified during the thematic analysis of the data. Table 7.7 depicts a representation and discussion of the themes and sub-themes identified from the electronic reflections received.

Table 7.7: Reflections on the first iteration: themes and sub-themes supported by affordances of Bower (2008)

THEMES	SUB-THEMES
The <i>accessibility</i> and <i>move-ability</i> of mobile devices afforded a great learning platform 	M-learning effective in providing a platform for engagement Revision helped to comprehend anatomy and physiology
Group work promoted <i>link-ability</i> and <i>share-ability</i> 	Learning in a group made learning easier The WMG enhanced peer support Some difficulty to get others to participate
The study was effective but time consuming, relating to <i>view-ability</i> and <i>video-production-ability</i> 	Positive experience producing the video Time allocated for tasks should be more reasonable Creating the video was time consuming

Less <i>accessibility</i> experienced due to Internet access challenges 	Sending the videos created challenges with data/airtime/Wi-Fi
Less <i>accessibility</i> experienced due to technical difficulties 	Challenges experienced with functions of personal mobile device
	Poor network access impaired communication
Busy clinical facilities impacted on <i>view-ability, write-ability and video-production-ability</i> 	Testing knowledge while time restrictions
	First iteration activities were challenging and competitive
<i>Permission-ability</i> proved to elicit ethical challenges 	Use of mobile devices seemed unprofessional
	Prohibited from using mobile devices within clinical facilities
<i>Share-ability</i> and <i>view-ability</i> may afford copying and pasting of answers 	

The principles or rules collated from the exploration phase were included in the presentation and discussion of the data collected to ensure adherence to enhance the trustworthiness, credibility, dependability, confirmability and transferability of the research findings. The colour key chart was presented before the presentation of the data analysis of the first iteration to prevent duplication.

7.5.1 Theme 1: The “accessibility” and “move-ability” of mobile devices afforded a great learning platform

Students viewed the m-learning initiative using WhatsApp Messenger as “*innovative and it shows how social media can also be an educational platform*” to research and discuss challenges with one another as it “*created a new method of learning and communicating with students and with the health workers*”. It was reflected that WhatsApp Messenger created an

interesting and innovative educational platform, using social media, through which students could test their own knowledge and clinical abilities, thus motivating them to work harder.

I can say that it was interesting and also innovative and it shows how social media can also be an educational platform. (SFGP 2)

One student, a pharmacology tutor, who participated in the study, reflected using WhatsApp Messenger as a “breakthrough in the emerging war of electronic studies”. The student was motivated to start a tutoring pharmacology WMG to enhance students’ learning process, which elicited very positive responses and results.

We had messages on the group (WMG) that we had to read and that I found so interesting. So I then opted, because at the time I was tutoring at Pharmacology. I opted to create a WhatsApp group with the Pharmacology students. (SFGP 5)

Initially, the pedagogical use of mobile devices in education was primarily focused on reinforcement – to stimulate motivation and to strengthen engagement – while its secondary use was to deliver content (Sung *et al.*, 2016). Mobile devices promote m-learning interventions as they offer a variety of distinguishing attributes that include individualized interfaces, real-time access to information, context sensitivity, instant communication and feedback (Sung *et al.*, 2016). Through affordances such as *accessibility* and *move-ability*, mobile devices afforded students a platform through which to receive activities as communicated by the researcher, in order to enhance the integration of their theory and clinical practice of the health assessment of the ear. It was stated:

WhatsApp app is easy, it’s available, it’s affordable for the students, and it is also an easy way for the student to learn. (EFGP 2)

Conclusion from the findings: It can be concluded that students experienced WhatsApp Messenger as affordable and as an innovative educational platform that offered them new methods of learning, communication and testing their knowledge and clinical abilities. The study also motivated a student to start a WMG to extend the learning process of others.

Design principle: WhatsApp Messenger is an innovative educational platform used to motivate students and encourage their participation in learning course content to achieve course outcomes.

Sub-theme: M-learning effective in providing a platform for engagement

Students in this study perceived m-learning as a modern, informative and easily accessible method of communication that afforded a “*clear understanding on how to do an ear examination*” (SRP24). Students experienced that the deadlines set for the submission of answers to the tasks improved their time management skills. When completing the tasks, they were engaged with the module content, something they might not have done if they were not participating in the study. The tasks (modelled scenarios from their primary care and clinical module) communicated in the WMG guided them through the structure of exam questions.

I loved the fact that it's quick and easy-t- use and especially corresponding with each other. I also like the fact that it is a modern way of studying. (SRP 37)

The WMG was perceived as a good platform for reviewing prior knowledge.

Tested my memory and retrieving capacity. (SRP 39)

The PHC guide (primary care and clinical module guide) on our phones and therefore is making me more aware of how exam questions are asked must be answered. (SRP 90)

Students responded that even though this was a new, modern learning experience in which the latest mobile technology was used, it provided a platform for engaging with work content, affording “*quick and easy use*” and being able to learn in a short space of time. The WhatsApp Messenger activities afforded students with a clear understanding of how to do the health assessment of the ear and they viewed the platform as informative and easily accessible. Mobile devices have become an expected and essential method of communication for students belonging to the Millennial or Net generation who value the daily use of technology. Most students have been found to have a web-capable mobile device that is able to text message and search web pages at any time of the day (Wilson & Bolliger, 2013). Increased use of m-learning technology affords engagement, taking active learning to new heights and allowing students to explore and share meaningful learning experiences (Wilson, 2013). A systematic review on the use of mobile learning in higher education identified that mobile phones were largely used in research conducted at in higher education institutions (Crompton & Burke, 2018).

Students also reflected that the WMGs allowed them the opportunity “*to bond also with the other people that you work with in the facility*” and it has been concluded that group cohesion

was promoted through the study. Students were also motivated to do research on the topics being discussed and clarified uncertainties among themselves as “*you get different answers from different perspectives*”, which meant that they did not need clarification from educators within the WMG.

The research was exciting because the first week it was new and you didn't know what to do and you got to bond also with the other people that you work with in the facility. You got to make a video and you were learning. (SFGP 1)

I feel like probably individually people went home and probably individually researched on the topics that they were dealing with on that particular day. (SFGP 2)

In terms of us students coming together, it was easier because a question get to be posted and then you get different answers from different perspectives of people. (SFGP 3)

WhatsApp Messenger was viewed as a breakthrough tool that promoted 1) self-study through research on activities communicated; 2) clarifying discussions among students; and 3) group cohesion. The use of WhatsApp Messenger activities afforded students a clear understanding of how to do the examination of the ear and they viewed the platform as informative and easily accessible.

It can be concluded that m-learning was effective as an innovative technology, as it afforded a new, contemporary way of learning using the latest technologies.

Design principle

WhatsApp Messenger, a m-learning platform for engagement, can be utilised for real-time discussions and responses to enhance learning.

Sub-theme: Revision helped to comprehend anatomy and physiology

Using their mobile devices, students found the WMG useful for revision and specified that the tasks were communicated in an entertaining manner. The responses received from students were an indication that there was a need to review the anatomy and physiology of the ENT, even though it was included in their human biology modules facilitated in their first and second-year of study.

I found doing the questions that was presented was a fun way of revising the work that we have learnt in class. It also tests our knowledge on what we know and helps us recognise the areas that we lack in. (SRP 32)

Even though students perceived the m-learning enactment as entertaining, it is important to note that learning did take place.

I could distinguish between an “ill” ear and an healthy ear as well as formulate a diagnosis based on my findings. (SRP 41)

In one of the clinical facilities the “community” changed as the nursing personnel at clinical facilities became involved in the tasks communicated to students.

I found the task of naming parts of the anatomy quite exciting, even staff at our clinic was caught up in our excitement! It was simple, quick and encouraged team work. I would enjoy more tasks like that. (SRP 73)

A study by Farley, Murphy, Johnson, Carter, Lane, Midgley, Hafeez-Baig, Dekeyser and Koronios (2015) in an Australian Regional University identify that 87% of students preferred using their mobile devices to support their learning, whether in class or when off-campus. Using WhatsApp Messenger on their mobile devices allowed students to engage with their learning material in an entertaining manner. Educators experienced that the tasks communicated using the WMG afforded students with an opportunity to revise their theory while within clinical practice.

It was a form of revision for the students. (EFGP 3)

Educators confirmed that this was a good opportunity for revision. Revision of prior knowledge of the normal anatomy and physiology, completed in the first and second-year of study, enabled students to identify an abnormal presentation in the anatomy and physiology during the health assessment of the ear.

It can be concluded that it was important to review prior knowledge of the normal anatomy and physiology of the ear to establish if students had the knowledge to identify any abnormal presentation of the structures of the ear during the health assessment.

Design principle

WhatsApp Messenger, the m-learning platform for engagement, can be used to review and

assess prior knowledge.

Evaluation: AT (Engeström, 2001)

The tool/mediating artefact: Using WhatsApp Messenger as a method of communication to enhance ITCP of the ENT health assessment enhanced the “accessibility” and “move-ability” of mobile devices and afforded a great learning platform to students (community). It also provided students with a platform for engaging and reviewing anatomy and physiology material completed in the first and second-year of study.

7.5.2 Theme 2: Working in groups is an effective way of promoting link-ability and share-ability

In this study, students were grouped into WMGs according to the clinical facilities where they completed their clinical practice. Establishing group norms prior to the enactment was important in ensuring group cohesion, thus promoting: *link-ability* (being able to make contact with one another using WhatsApp Messenger) and *share-ability* (being able to share course-related information between group members). A study by Barhoumi (2015) at a university in Saudi Arabia, based on AT, indicates that there was value in the implementation of a collaborative and whole class learning activity designed to provide opportunities for students to share their knowledge and experiences through discussion and comments in WhatsApp Messenger.

Sub-theme: Learning in a group made learning easier

Students identified that working collaboratively in a group on m-learning activities communicated via WhatsApp Messenger was effective and enhanced the learning process, even though the student groups were competitive.

In a way this learning platform promote group learning which I do appreciate and enhance learning outside school settings hence it worth adopting. (SRP 4)

Being able to communicate and get work completed without having to meet with the next person was an easy task. (SRP 86)

The case study allowed us to be innovative and have fun with our knowledge, as we were to make a video on history taking. (SRP 95)

M-learning research have established that the usefulness and ease of use of the mobile technology are the main factors that influence students’ participation and adoption of online m-

learning interaction, thus extending their online community of practice (Barhoumi, 2015). Feedback from students indicated that working together in a group made learning easier and they acknowledged that their learning was enhanced. The WMG enhanced communication among group members and they were able to complete their tasks without having to meet in person. Educators were positive about how the m-learning initiative enhanced group cohesion, facilitated by students' engagement with the course content and discussions among students and with nursing personnel in clinical facilities.

They engaged with the content. It is almost like an awareness. They engaged and they discussed and that is the important thing that they talk, whether it is among themselves, whether they discussed with sisters in the facility, but it gave an opportunity to discuss. (EFGP 4)

It can be concluded that WMGs promoted group cohesion and enhanced communication, even though participants did not meet up.

Design principle

Learning tasks should be designed to promote group participation and to encourage dialogic and collaborative student learning.

Sub-theme: The WMG enhanced peer support

The WMGs encouraged collaborative learning in an "enjoyable" online "working" environment. The instant responses on activities in real-time was positively reviewed by participants.

We spoke more or connected more while doing the video. (SRP 25)

Working together as a group made the process much quicker. (SRP 31)

It taught me how to work in a group towards a common goal. (SRP 75)

Students' social connections, through online discussions and participation in student social learning communities through an artefact (such as m-learning communities), improved their self-esteem and boosted their learning performance (Yu, Tian, Vogel & Kwok (2010). Bouhnik and Deshen (2014) identify some of the academic advantages of a study using WhatsApp Messenger, a smartphone application. Working together towards a common goal within the WMG created the opportunity for students to complete the task faster and they were able to learn from one another.

It also promoted the group interaction and tested their knowledge that they have acquired in theory and put it into practice. (EFGP 3)

It can be concluded that the WMG enhanced the completion of tasks and created opportunities to learn from the more knowledgeable student.

Design principle

The WMG enhanced peer support by creating a collaborative online working environment.

Sub-theme: Some difficulty to get others to participate

Students identified challenges with getting group members together to complete the tasks. The challenge appears to involve the participation of students when producing the video to demonstrate their technique of the health assessment of the ear.

M-learning “increased motivation, especially among learners who were normally considered to be distant, disengaged or disenfranchised. M-learning thus improves retention and progression” (Traxler, 2007).

Challenges experienced were contradictory to findings in literature that m-learning increases motivation among students. Students experienced challenges in getting group members together within the clinical facility to complete the communicated tasks.

It is very difficult to get all the members of a facility together to perform these tasks.

(SRP 1)

A clinical facilitator experienced that, as students were working within groups during the m-learning intervention, some students still refused to report the findings of their activities, shifting the responsibility to other members in the group.

To do reporting, some students shifted the responsibility. (CFRP 104)

It can be concluded that group norms will have to be established specific to the function of each member of the group regarding the completion of activities prior to the m-learning intervention in addition to the rules of engagement.

Design principle

Establishing the rules of engagement, including group norms and values, could increase a sense of responsibility to complete tasks together at an agreed-upon time.

Evaluation: AT (Engeström, 2001)

The tool/mediating artefact: WhatsApp Messenger as the tool or mediating artefact enabled effective group work and enhanced peer support, thus promoting link-ability and share-ability.

7.5.3 Theme 3: The study was effective but time consuming, relating to “view-ability” and “video-production-ability”

Students reflected that the production of videos to display their examination techniques of the ENT health assessment was time consuming due to *view-ability*, as they viewed their video to see if they had to redo the video, and *video-production-ability*, as they made videos over and over until they viewed it as perfect for submission. Gašević, Dawson and Siemens (2015) describe that educational technology has been transformed through three distinct generations of development and now a fourth generation is emerging. The fourth generation of technological development includes the distribution of digitally shaped technologies, supported by adaptive learning, distributed infrastructures and competency models. Education using videos is one of the elements of ‘distributed interactions’ exploring the role that video plays within education.

After you’ve discussed it and show them what they must do and how they must do it you had to leave. You can’t stay there while they’re doing the video. (EFGP 2)

The provision of training and ongoing technical support is important for enabling the successful use of technologies to enhance current and future instructional activities (Naismith *et al.*, 2004).

Sub-theme: Positive experience producing the video

Students were divided regarding their experiences of producing the videos to display their examination techniques of the ENT health assessment. While some reflected that the video production took too much of their time, others were positive about their experience of producing the video.

We had limited time to compile the video. But it was fascinating. (SRP 84)

Students revealed that producing the video allowed reflection and it was seen as a great way to display their “*knowledge and practical skills*”, which was better portrayed in the video rather than having to write it down and reading it.

The video was important because some other things cannot be properly explained through like words or speaking because nursing is all about practical work, it is all about skills. (SFGP 2)

It can be concluded that there are positive educational attributes to the production of videos such as being able to display the integration of theoretical knowledge into clinical examination skills of the ENT health assessment.

Design principle

Learning tasks that incorporate the functions available on mobile devices, e.g. creating videos, can be used to reflect the integration of theory and practical skills acquired while in clinical practice.

Sub-theme: Time allocated for tasks should be more reasonable

Students claimed that the completion of their tasks and responses on activities within a certain time frame was challenging. During the initial workshop, prior to the commencement of the first iteration, there was an agreement on the most appropriate time to communicate activities to students using the WMGs (e.g. before tea, before lunch, etc.). The time agreed upon during the preparation workshop for the completion of tasks, however, became problematic when students went into clinical practice. One of the challenges identified was that students could not go to tea and lunch at the same time as that would impact the optimal functionality of the clinical facility. Another challenge was that having to use their tea and lunchtime meant that they had no time to rest during their “work day”.

Did not feel happy to do in tea and lunch, it is time I take to relax and with the online learning you did not get any break until you go home. (SRP 16)

Participants advised that activities should not be communicated according to the agreed time frame but that it would be more convenient to send all the activities proposed at enhancing the integration of their theory and clinical practice in one message and students could complete and respond when they had time during the course of the two days while in clinical practice.

I would just advise you not to limit us when it comes to time, to give us the activity for the whole day so that we can do it properly when we find time. (SRP 68)

Berry, Lobban, Emsley and Bucci (2016) reason that, if the intervention is not acceptable to participants, then they would unlikely participate in it. It is thus important to measure the proposed and actual acceptability of online m-learning interventions with an improved focus on the features that would influence its acceptability. The m-learning research study using WhatsApp Messenger was considered effective but time consuming because it delayed the completion of the clinical objectives students had to achieve.

One of the clinical facilitators identified that students were stressed due to the number of activities communicated and that time management was problematic.

What I noted is that the students are not very good with time management and it wasn't easy for them to switch from the one thing that they were busy with to the next thing. (EFGP 3)

It could be concluded that there should be flexibility around the completion and submission times of tasks. There should not be set time frames within which tasks, communicated to the WMG while students were in clinical practice, should be completed. Students could now essentially complete all the tasks communicated during the two-day period they were in clinical placement.

Design principle

Flexibility regarding the completion of tasks communicated is important to enhance continued participation in a m-learning intervention.

Sub-theme: Creating the video was time consuming

Students found the production of the video to be challenging, as it took two to three hours to complete even though the instruction was to create a one to three-minute video to display their clinical skills of the health assessment of the ear. Students focused on perfecting the task of creating a video to display their examination skills of the health assessment of the ear and it thus became a time-consuming task. It also delayed the expected outcomes of their clinical placement. Students correctly reflected that, even though not perfect, the video could still be used as an educational tool.

Creating the video took up quite a bit of time in your day, but it ended up being my favourite part of the entire forum. (SRP 31)

Other problems we identified was that it took a lot of time out of the working day (approximately 3 hours). This was time we could have spent completing objectives and learning in the facility. (SRP 91)

If we want to focus on perfection, that's where we lose time. (SFGP 5)

According to Martin (2016), context-based learning tools, including instructional technology such as videos, may offer various advantages in the development of students' knowledge regarding the phenomena under study. Videos can afford the sharing of educational information in a very interesting manner and develop complicated perspectives in a simplified way (Cognition and Technology Group, 1992). An animated video teaches students that it is okay to make mistakes as they learn from their mistakes. A video with mistakes in it can become a teaching resource to create a teachable moment within the class context (www.watchknowlearn.org).

When a mistake is made, it is frequently viewed in a negative manner and fear can impact the potentially positive contribution. There has, however, been evidence that dealing with mistakes made in a learning context where clear feedback and tolerance for errors occurred is more effective than avoiding them (Keith & Frese, 2008; Nordstrom, Wendland & Williams, 1998).

One of the participants of the focus group with educators were not very comfortable with the activity that students had to produce a video to demonstrate their examination skills of the health assessment of the ear. The specific reason was the exposure of the patient or the student and the perception was that students would not react well to criticism.

With the request that the student must do a video clip I was also feeling a little but (sic) uneasy because somehow they either expose the patient and they also use themselves as patients. Now they have to do a video and now you are actually rectifying or saying negative things and maybe they don't take it that well. (EFGP 5)

Producing a video has been an experiential task for students and they should be instructed to submit their first draft should they be asked to produce a video on clinical examination techniques of the health assessment of the ear. The focus should not be on correctness as this could be the reason why the video took so much time to be produced and students should be informed that any video can be used as a teaching tool, perfect or imperfect.

It can be concluded that producing a video was indeed time consuming as students did not have prior training on how to produce a video to display their examination techniques of the health assessment of the ear. Reviews of activities submitted by students should be used as an educational tool to guide and correct clinical practice.

Design principle

Sufficient training and instruction should precede online tasks communicated during a m-learning intervention and should focus on the need and practicality of the learning task.

Evaluation: AT (Engeström, 2001)

Rules of engagement: The rules for the intervention were confirmed at the workshop presented to students and educators (community) before the first iterative cycle of the intervention commenced. Reflective online responses received from students and clinical facilitators (community) identified challenges experienced while using WhatsApp Messenger (mediating artefact) as a communication tool to enhance ITCP. The rules of engagement thus had to be adapted.

7.5.4 Theme 4: Less accessibility experienced due to Internet access challenges

Internet challenges impacted accessibility to online learning tasks communicated to students using WhatsApp Messenger. A study by Liebenberg, Chetty and Prinsloo (2012) identified that is important to be aware of costs associated with Internet access within a South African context in efforts to encourage the use of mobile technology for educational purposes. Students may have access to the Internet on their mobile devices for personal activities and be willing to pay for this usage, but they may not be willing to pay for the use of mobile technology for their study or learning activities. Smartphones have brought computing power into the palm of students' hands, resulting in Internet connectivity almost anywhere and anytime in South Africa (Liebenberg *et al.*, 2012).

Sub-theme: Sending videos created challenges with data/airtime/Wi-Fi

Students experienced challenges with Internet connection while in clinical facilities related to their personal lack of data to submit videos produced thus limiting *accessibility*. It was identified that the production and sending of the video produced to display their clinical examination skills required a lot of data. When running out of data bundles, students were forced to make alternate arrangements to send their completed task.

There is only one downside to the whole electronic-learning process and that is data usage. (SRP 3)

Making the video was an issue because it took a lot of data. (SRP 17)

When we tried submitting our data ran out and had to make alternative arrangements for submission. (SRP 22)

Students identified the importance of ensuring network coverage and free Wi-Fi at clinical facilities for this “*generation of technology*” to ensure their ability to submit tasks while participating in a m-learning project.

I think that now we are somehow in a place, we are in this generation of technology. So somehow if I can say that if facilities could allow to have like Wi-Fi in facilities it would make all of our work easier. (SFGP 3)

In February 2016, the Premier of the WCP announced in the State of the Province Address that the province will launch 384 hotspots. One hundred would be launched during the 2016/17 financial year and the remaining 234 during the 2017/18 financial year. This would provide users with access to 250MB of data a day per month and unlimited access to all.gov.za websites (www.goodthingsguy.com). This initiative would enhance free access to the Internet for students who do not live in the university residences where free Internet access is available.

With regards to Wifi, personally, I found it much easier with regards to data. I find it much easier to submit in time because our facility is more advanced because there was free Wi-Fi installed there. So it was much easier. I could connect anytime. (SFGP 3)

I think once we overcome the issue of data this should be one of the breakthrough in the modern learning society. (SFGP 5)

Even though students have identified that the time needed to make the videos was challenging, it would seem that sending the video in the WMG was just as challenging due to data needed to upload and send the video. Students were very innovative by waiting until they were either home or back on-campus where they had free access to the Internet to upload and send the video. It has to be noted that some of the clinical facilities had free Wi-Fi access which made it easier for those students to communicate using WhatsApp Messenger.

It can be concluded that students should be permitted to submit the video created after hours when they are back at the university residence or at home or at a public facility where they have free Internet access. Where possible, data should be provided to students to allow continuation in their learning process.

Design principle

Good network coverage and access to free Wi-Fi is an important component of a successful m-learning initiative.

7.5.5 Theme 5: Less “accessibility” experienced due to technical difficulties

During the workshop, in preparation for the enactment, students were discouraged to seek the help of a consultant due to confidentiality of the study. They were advised to rather consult with the researcher when experiencing problems with their mobile devices. Students did experience technical difficulties when accessing the network using their personal mobile devices, which impacted *accessibility*.

Confidentiality around data security and ensuring the patients’ privacy must be carefully considered when integrating mobile technology into an educational environment in health care. Unauthorised access to patient-related records or the loss of a mobile device with information of patients on it, may pose a threat to confidentiality. A basic step to reduce unauthorised access to smartphones is to use the built-in password protection feature on the mobile device (Luxton, McCann, Bush, Mishkind & Reger, 2011).

It can be concluded that access to technical support while ensuring confidentiality would be of importance during a m-learning enactment (intervention).

Design principle

Technical support should be offered to participants in m-learning interventions.

Sub-theme: Challenges experienced with functions of personal mobile device

There were students who volunteered to participate in the study and met the inclusion criteria, but who struggled to open WhatsApp Messenger on their mobile devices. One group was given a mobile device by one of the nursing personnel at one of the clinical facilities to make a video to display their examination techniques of the health assessment of the ear.

The only struggle we had was when we were trying to record the video because both our cell phones were problematic, but the staff nurse gave us her's to do the video on. (SRP 94)

It can be concluded that, even though the inclusion criteria stipulated that participating students had to have their own mobile device that could access WhatsApp Messenger, and that they should have access to a reliable Internet connection off-campus, students “made a plan” to be included in the study.

Design principle

Different multimodal possibilities, for example video or digital recordings, should be offered to students to represent their learning using mobile devices.

Sub-theme: Poor network access impaired communication

Students experienced problems with some of the functionalities of their personal mobile devices and with Internet signals (broadband), which had an impact on their ability to communicate. Broadband connections with their Internet service providers were problematic to some, while others had difficulties with insufficient data.

At the facility where we were placed had some technical difficulties because the network coverage wasn't so nice there. (SFGP 4)

We experienced signal problems at work and not everyone had data so it caused somewhat confusion and chaos. (SRP 21)

Also at some clinics the network is very poor so that impairs the communication process and sometimes inhibit us from getting the necessary information. (SRP 37)

A study on the effectiveness of m-Health interventions targeting healthcare workers identified technological problems, such as problems with mobile network coverage, Web-based access, electricity access and maintenance of mobile phones (www.mhealthknowledge.org; Ngabo, Nguimfack, Nwaigwe, Mugeni, Muhoza, Wilson, Kalach, Gakuba, Karema & Binagwaho, 2012; Woods, Attwell, Ross & Theron, 2012). In his 2017 State of the Nation Address, Former President of South Africa, Jacob Zuma acknowledged the challenges related to network access and coverage, stating, “We assure the youth that the lowering of the cost of data is uppermost in our policies and plans” (www.polity.org.za).

During the feedback session at the end of the first iteration, students were given an overview of the enactment during a face-to-face session. They were also invited to ask questions to clarify uncertainties before the next iteration. An online tutorial on the health assessment of the ear was made available to students who could not participate in this research study.

It can be concluded that a student who wished to participate in a m-learning project must have a phone that can take pictures, make videos and connect to the Internet. There should, however, be an alternative intervention to assist students who are not able to participate in a m-learning intervention. Students should be allowed to submit videos after hours when they have access to free Internet.

Design principle

Timeous submission of group tasks or assessments should be viewed as an important component of the m-learning initiative, with the understanding that some students may experience poor network access that could delay the submission of their answers.

7.5.6 Theme 6: Busy clinical facilities and time constraints impacted on “view-ability”, “write-ability” and “video-production-ability”

The clinical facilities where students were placed for their clinical practice was deemed busy and this state had an implication on the *view-ability* of activities communicated to students, their *write-ability* in responding to the activities and the available time to produce videos of their examination techniques of the health assessment of the ear, thus impacting *video-production-ability*.

The clinical facilities are very busy so it is difficult to make time for the cases that we have to complete. (SRP76)

Students encountered challenges when participating in the WMG as the staff of the clinical facilities were busy and could not readily check for and respond to prompted activities.

It can be concluded that students experienced that the set time frame within which tasks were supposed to be submitted within clinical facilities challenged their participation in the WMGs as the clinical facilities were very busy.

Design principle

Learning activities should be scheduled at times that suit the students and fit into the daily

routine of the clinical facility to minimise challenges with participation.

Sub-theme: Testing knowledge while under time restrictions

Students expressed that it would be more appropriate to do the intervention on-campus as the clinical facilities are very busy. They identified that the assessment of their knowledge while within the clinical facility was restricted by time. One student felt distracted from work, viewed the tasks communicated as being testing and complained that they had to respond without understanding the work.

The tasks that we did were very helpful. But I feel that it would have been better and more efficient if it was done on-campus. At the facilities we sometimes do not have time to check our phones and it is busy. (SRP 56)

Dimond, Bullock, Lovatt and Stacey (2016) identify that there is still a lot more to be learned on how mobile technologies are used in clinical practice, how rules are decided upon and how to enact with mobile technology within the hospital environment. A lack of understanding of smartphone use and the associated etiquette is partially a consideration of the divergence between the speed of development in technology and the unfortunate slower academic model of research and dissemination of information.

It can be concluded that the option of presenting the WMG tasks within a blended environment on-campus should not be excluded.

Design principle

Providing a blended learning environment while students are on-campus, with free Internet access, should be included in m-learning initiatives.

Sub-theme: First iteration activities were challenging and competitive

Students' referred to the first online activity communicated via WhatsApp Messenger as an online tutorial. They indicated that students were competing to be the first ones to respond to the activity communicated. The first activity was deemed difficult; however, students were able to complete the task because they could work on the activity collaboratively.

It was quite challenging as it was our first time doing the WhatsApp tutorial. We did not have enough time. (SRP 54)

Students' experienced challenges with the first activity that was communicated within the WMG, but they remarked that students were competing to complete the task before the other groups.

The study platform came to us like a breakthrough, most especially in the competitive nature of it, because we were now studying in a group. (SFGP 5)

Creating an authentic learning community for journalism students impacted the students' engagement, learning and participation. A significant observation of students was the notion that you learn by becoming an active participant in your learning process (Cochrane, Sissons, Mulrennan & Rive, 2016).

It can be concluded that, although the first activity was challenging, this teaching and learning methodology using mobile devices was a new concept for the students.

Design principle

M-learning activities using WhatsApp Messenger could be used to promote self-study through research on activities communicated and discussions among students and between students and educators.

7.5.7 Theme 7: "Permission-ability" proved to elicit ethical challenges

Students identified some ethical challenges experienced with using a mobile device while within clinical practice due to the cell phone policies of the clinical facilities. Emphasis is thus placed on *permission-ability* to participate in the study while within clinical practice.

Sub-theme: Use of mobile devices seems unprofessional

Nursing personnel at clinical facilities where students were placed could not comprehend a m-learning initiative to enhance ITCP as it was not an accepted practice. The m-learning intervention was viewed as an inconvenience as using a mobile device was "frowned upon". A detailed letter informing facility managers about the study was made available to clinical facilities where permission was granted to conduct the research study.

It did serve as an inconvenience during my working hours as most since mobile device usage is frowned upon during our hours at the clinic. (SRP 23)

We were at facilities and sisters (registered nurses) couldn't understand why we using our phones (mobile device) while working however I have learnt a lot from this study. (SRP 78)

A research study involving junior doctors identified that participants were concerned about the use of mobile devices in front of their patients and ward personnel. It was perceived that their mobile devices presented a visible challenge to unspoken rules of ward or professional behaviour. The junior doctors were aware that using their mobile devices challenged the workplace boundaries, evoking potential unwelcome attention and disapproval. The uncertainty experienced in the use of mobile devices was related to concerns about how others might misunderstand their use of a mobile device. Judgements were made regarding the extent to which colleagues or patients might be open to the use of new technology in a healthcare setting (Dimond *et al.*, 2016).

It can be concluded that it all nursing personnel associated with clinical facilities should be included in the information workshop when planning a m-learning intervention to ensure that there is a mutual understanding of the expectations of students during the iterative cycles.

Design principle

All facility nursing personnel involved in student learning should be included in a workshop to establish ground rules regarding the use of mobile devices in clinical facilities supported by facility policies on cell phone usage.

Sub-theme: Prohibited from using mobile devices in clinical facility

Students experienced challenges with nursing personnel in clinical facilities refusing that students use their mobile devices. Clinical facilities do have cell phone policies that have to be adhered to and respected. Special permission had to be obtained from the Western Cape Department of Health to conduct the study in two of the clinical facilities where our students are placed for their clinical learning experiences. The researcher met with facility managers where permission was granted to conduct the study and a verbal and written overview of the study was provided.

At the facility we did experience a lot of difficulties. The acting manager did not want us to be on cell phone. (SRP 16)

And the facility in which I am placed cell phones are strictly prohibited. (SRP 38)

Frohberg, Göth and Schwabe (2009) discovered that although most m-learning activities took place across different geographical settings, they were limited to a certain physical context and an official environment. In areas where students are prohibited to participate in a m-learning intervention, the appropriateness of the intervention should be reviewed.

It can be concluded that permission have to be obtained from the relevant health authorities, followed by an information session on the initiation of a m-learning initiative with facility management and all nursing personnel. The cell phone policy of clinical facilities also has to be discussed with students and adhered to during the m-learning intervention.

Design principle

In health facilities, adherences to facility policies on cell phone usage while working with patients are important.

Evaluation: AT (Engeström, 2001)

Community: The experiences of students established that all nursing personnel engaged in the clinical teaching of students at clinical placement facilities, together with students and educators as the community, had to be included in the intervention.

7.5.8 Theme 8: “Share-ability” and “view-ability” may afford copying of answers

Students experienced challenges with *share-ability* and *view-ability* of their tasks by other groups. A concern was raised that this practice allowed other groups to view their answers once shared in the WMG, allowing them to copy and paste their correct answers.

Sending answers to one group was not right because people were copying answers from others. (SRP 17)

Every clinical facilitator formed one group for all the facility groups and students identified that, because there was more than one clinical facility group in the one WMG, some facility groups appeared to have copied and pasted the work submitted by other groups within the WMG. Hwang and Tsai (2011) reviewed 154 articles on the use of mobile technology in higher education in the fields of language, arts, engineering, and computer technology published in six journals between 2001 and 2010 and concluded that the use of m-learning is increasing. With the

increase in the use of mobile devices to enhance learning, the rules of engagement would have to clearly indicate the repercussions of plagiarism within an online working space.

It can be concluded that, to prevent students from copying and pasting one another's work, every clinical facility and the students allocated to that clinical facility should have their own WMG.

Design principle

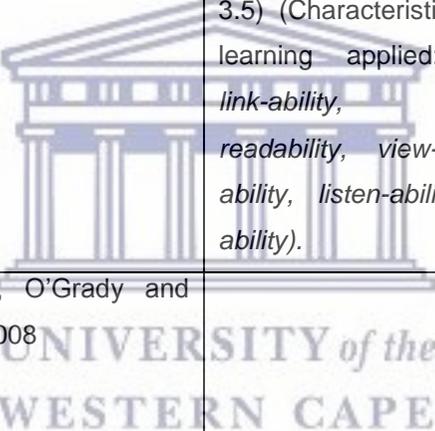
The consequences of plagiarism should be highlighted in online m-learning interventions.



UNIVERSITY *of the*
WESTERN CAPE

Table 7.8: Refinement of the draft design principles after the first iteration

DRAFT DESIGN PRINCIPLES (DDP) IDENTIFIED AS RULES IN THE EXPLORATORY PHASE IN CHAPTERS (CH) 3, 4 AND 5	SOURCE REFERENCE	DRAFT DESIGN PRINCIPLES SUPPORTED BY THE AFFORDANCES (BOWER, 2008)	REFINEMENT OF THE DRAFT DESIGN PRINCIPLES AFTER THE FIRST ITERATION
Social interaction plays an important role in the cognitive development of the student, as outlined by social constructivism of Vygotsky (1978), and as a theoretical underpinning of this study. (CH 3: DDP 10)	Vogt, Maschwitz and Zawachi-Richter, 2010	Acknowledge the role of social interaction in the cognitive development (<i>accessibility, linkability</i>) of the student.	WhatsApp Messenger is an innovative educational platform used to motivate students and encourage their participation in learning course content to achieve course outcomes.
Situated learning is the appropriate learning theory with the constructivist epistemological orientation that indicate the role of the student (learner), lecturers and clinical facilitators (instructor) and the implications for instruction. (CH 3: DDP 9)	Brown, Collins and Duguid, 1989; Brown, 2009; Lave and Wenger, 1991	Identify an appropriate learning theory, e.g. situated learning (<i>reliability</i>).	<p>Learning tasks should be designed to promote group participation and encourage dialogic and collaborative student learning.</p> <p>Establishing the rules of engagement (including group norms and values) could increase a sense of responsibility to complete tasks together at an agreed-upon time.</p>

<p>The nine characteristics of the authentic learning are important for establishing knowledge and skills within a real-life setting. (CH 3: DDP 13)</p>	<p>Herrington and Oliver, 2000; Reeves and Okey, 1996; Herrington and Herrington, 1998, in Herrington and Herrington, 2006</p>	<p>Illustrate the application of the nine characteristics of authentic learning, supported by flexible and blended learning environments aimed at enhancing students' online learning experiences (Chapter 3; Table 3.5) (Characteristics of authentic learning applied: <i>accessibility, link-ability, write-ability, readability, view-ability, speak-ability, listen-ability and share-ability</i>).</p>	<p>WhatsApp Messenger, the m-learning platform for engagement, can be used to review and assess prior knowledge.</p> <p>Providing a blended learning environment while students are on-campus, with free Internet access, should be included in m-learning initiatives.</p>
<p>In a flexible learning environment, every individual student learns to use the social media application on their mobile devices at any time or any place to suit their learning needs. (CH 3: DDP 2, 3, 8 & 14; CH 4: DDP 5; CH5: DDP 2)</p>	<p>Shurville, O'Grady and Mayall 2008</p>		<p>Flexibility in the completion of communicated tasks is important to enhance continued participation in a m-learning intervention.</p>
<p>A combination of face-to-face and online learning experiences, blended learning, creates an interactive learning platform. (CH 3: DDP 15)</p>	<p>Garrison and Vaughan, 2008</p>		

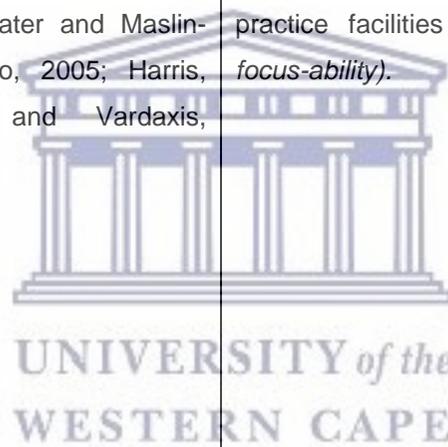
Preparation of all students, lecturers and clinical facilitators for an authentic WhatsApp Messenger ensures the success of a m-learning intervention (CH 3: DDP 5 & 3; CH 4: DDP 4; CH 5: DDP 2)	Johnson, Onwuegbuzie and Turner, 2011; Makoe 2012; Nicholson 2002; Rambe and Bere 2013; Yeboah and Ewur 2014; Barhoumi, 2015	Introduce a blended learning approach to prepare students, lecturers and clinical facilitators for an online m-learning intervention using WhatsApp Messenger (<i>accessibility, write-ability, readability, view-ability, speak-ability and listen-ability</i>).	Sufficient training and instruction should precede online tasks communicated during a m-learning intervention that focuses on the need and practicality of the learning task.
Cultivate a positive attitude towards the use of personal mobile devices for a m-learning intervention. (CH 4: DDP 7 & 8)	Baldwin, Mills, Birks and Budden, 2013		Different multimodal possibilities, for example video or digital recordings, should be offered to students to represent their learning using mobile devices.
Social interaction among students – including the MKO and the ZPD, the two main principles underlying the Vygotskian Framework – support cognitive development. (CH 3: DDP 10)	Vygotsky 1978; Cochrane, 2014; Makoe, 2012; Nicholson, 2002; Bere, 2013	Acknowledge the role of the MKO in peer support (<i>accessibility, link-ability, speak-ability and listen-ability</i>).	The WMG enhanced peer support by creating a collaborative online working environment.
Interactive and collaborative learning opportunities are extended by students “using” peers, as the MKO and as a “resource” within a WhatsApp Messenger group after hours (CH 3: DDP 7; CH 5: DDP 19 & 21)			
The LMS of the HEI offered on the Sakai platform, iKamva, could be actively used to share discussion			

and documents. (CH 5: DDP 23)			
Students should summarise and present an actual case with “real-life images” managed in clinical facilities, and an example should be provided on how to formulate a case study. (CH 5: DDP 25 & 26)	Le Roux and Khanyile 2012	Acknowledge the importance of the preparation and presentation of an actual case study to enhance learning (<i>accessibility, link-ability, speak-ability and listen-ability</i>).	M-learning activities using WhatsApp Messenger could be used to promote self-study through research on communicated activities, and discussions among students and with lecturers and clinical facilitators.
Learning using mobile devices is implemented from both prepared cases or a case study and an actual case that was managed based on focuses on certain common conditions within in the clinical facility. (CH 5: DDP 18, 25 & 26)	Aamodt, 1994; Le Roux and Khanyile 2012	Allow students to learn using the functions on their mobile devices at any time or any place to suit their individual learning needs (<i>accessibility, link-ability, write-ability, readability, view-ability, speak-ability, listen-ability and share-ability</i>)	Learning tasks that incorporate the functions available on mobile devices, e.g. creating videos, can be used to reflect the integration of theory and practical skills acquired while in clinical practice.
Resources are available during a m-learning intervention to combat challenges to access library search engines off-campus. (CH 4: DDP 6; CH 5: DDP 15 & 22)	Gupta and Koo, 2010; Mason and Rennie, 2008; Walton, Childst and Blenkinsopp, 2005; Kenny, Van Neste-Kenny, Burton, Park and	Provide resources during a m-learning intervention due to challenges identified to access library search engines off-campus (<i>accessibility, share-ability, link-ability, readability and view-</i>	

	Qayyum, 2012	<i>ability).</i>	
WMGs are established for every clinical facility to enhance interactive and collaborative communication and to ensure that all students have access to the “same amount of information”. (CH 3: DDP 6; CH 5: DDP 9, 10 & 17)	Johnson, Onwuegbuzie and Turner, 2011; Makoe 2012; Nicholson 2002; Rambe and Bere 2013; Yeboah and Ewur 2014; Barhoumi, 2015.	Establish WMG’s to enhance interactive and collaborative communication and to ensure that students have access to the “same amount of information” (<i>accessibility, link-ability, write-ability, readability, view-ability, speak-ability, listen-ability and share-ability).</i>	
Mobile devices are used as a resource to create an open-door policy between lecturers and clinical facilitators and their students. (CH 5: DDP 22)			
Students should be guided in the acquisition of clinical skills within clinical facilities by professional nurses as part of their workload. (CH 5: DDP 15)			
Provide opportunities for visualisation and interaction with learning content by using personal mobile devices e.g. WhatsApp Messenger (BYOD) (CH 3: DDP 4 & 12; CH 5: DDP 3 & 4)	Johnson, Onwuegbuzie and Turner, 2011; Makoe 2012; Nicholson 2002; Rambe and Bere 2013; Yeboah and Ewur 2014; Barhoumi, 2015	Provide students with online tasks to be completed as communicated via WhatsApp Messenger (<i>accessibility, link-ability, write-ability, readability, view-ability, speak-ability, listen-ability and share-ability).</i>	Timeous submission of group tasks or assessments should be viewed as an important component of the m-learning initiative understanding that students may experience poor network access delaying submission.
WhatsApp Messenger, a mobile messaging application, should be used in a m-learning intervention as it allows for immediate responses in real-time. (CH 4: DDP 11 & 12; CH 5: DDP 5, 6 & 7)			

<p>The use of a smartphone, with its technological advances, is a mode of communication for enhancing ITCP. (CH 3: DDP 1; CH 4: DDP 1, 10 & 14; CH 5: DDP 1 & 2)</p>	<p>Cook, 2010; McAndrew and Johnston, 2012; Rung, Warnke and Mattheos, 2014</p>	<p>BYOD to participate in an online m-learning intervention using WhatsApp Messenger as the mode of communication to enhance ITCP (<i>accessibility, link-ability and share-ability</i>).</p>	<p>The consequences of plagiarism should be highlighted in an online m-learning intervention.</p>
<p>It has value to BYOD in order to participate in a m-learning research study (inclusion criteria). (CH 5: DDP 8).</p>			
<p>Technical support should be in place during a m-learning intervention, even if participants know how to use their mobile devices effectively. (CH 4: DDP 1, 2 & 3)</p>	<p>Liu and Chu, 2010</p>	<p>Provide technical support to students and lecturers and clinical facilitators should they experience challenges with their mobile devices (<i>accessibility</i>)</p>	<p>Technical support should be offered to participants in m-learning interventions.</p>
<p>Mobile technology offers post-Web 2.0 pedagogical affordances for teaching and learning that enables engagement with students through Internet connectivity, mobility, geolocation and social networks. (CH 3: DDP 11; CH 4: DDP 9 & 13; CH 5: DDP 11 & 12)</p>	<p>Cochrane and Bateman, 2010; Cochrane <i>et al.</i>, 2014</p>	<p>Prompt students to explore the online learning activity to enhance their learning using WhatsApp Messenger (<i>accessibility, link-ability, write-ability, readability, view-ability, speak-ability, listen-ability and share-ability</i>).</p>	<p>WhatsApp Messenger, a m-learning platform for engagement, can be utilised for discussion and responses in real-time to enhance learning. Good network coverage and access to free Wi-Fi are important factors influencing the success of a m-learning initiative.</p>
<p>The best time for a m-learning intervention is at any</p>	<p>Lai, Yang, Chen, Ho and</p>	<p>Communicate learning tasks</p>	<p>Learning activities should be</p>

available time as guided by students, lecturers and clinical facilitators. (CH 4: DDP 5; CH 5: DDP 16 & 20)	Chant, 2007	within the identified time frame (<i>accessibility, link-ability, write-ability, readability, view-ability, speak-ability, video produce-ability and share-ability</i>).	scheduled at a time that suits the student and the daily routine of the clinical facility to minimise challenges with participation.
Upholding professionalism during a m-learning intervention includes professional and ethically correct conduct; respecting boundaries regarding cell phone policies of clinical facilities; and obtaining permission for a m-learning intervention (CH 5: DDP 13, 14, 15, 16, 21 & 24)	Baldwin, Mills, Birks and Budden, 2014; Freshwater and Maslin-Prothero, 2005; Harris, Nagy and Vardaxis, 2014	Motivate students to uphold professionalism while in clinical practice facilities (<i>reliability and focus-ability</i>).	All facility nursing personnel involved in student learning should be included in a workshop to establish ground rules regarding the use of mobile devices in clinical facilities, supported by facility policies on cell phone usage.
			In health facilities, adherence to facility policies on cell phone usage while working with patients is important.



7.6 RECOMMENDATIONS FOR THE SECOND AND THIRD ITERATIONS

Online reflections were received from participants on completion of the first iterative cycle, leading to the refinement of the draft design principles for the 2nd iteration. In Chapter 8, iterations 2 and 3 are described.

In line with the three fundamental principles of design-based research (Reeves, 2006), an iteration addresses the phenomenon of m-learning in a real context. This is done in collaboration with practitioners (including students, lecturers and clinical facilitators), integrating known and theoretical design principles with technological advances that provided possible solutions to the integration of theory and practice of a module. Reflective analysis is furthermore used to refine the design principles of the innovative learning environment.



8 CHAPTER: THE ENACTMENT AND REFLECTIONS ON ITERATION CYCLES TWO AND THREE



“Education is one of the blessings of life—and one of its necessities.”

Nobel Lecture by Malala Yousafzai

8.1 INTRODUCTION

This chapter is a continuation of the discussion in Chapter 7 and will continue on the enactment and reflections of the second and third iterative cycles.

8.2 THE SECOND ITERATION: THE NOSE AND SINUSES

8.2.1 Theory session: Week 3

The theory session in class on-campus started with a review of the positive aspects as well as the challenges experienced by students during the first iteration of the ear. Students were provided with a verbal summary of the online reflections received on the activities communicated using WhatsApp Messenger. Guidance was provided on the changes made to improve their experiences during the second iteration. Students were given the opportunity to comment on the recommended improvements based on their electronic reflections. Students attended an introductory theory session on the nose and sinuses on PowerPoint (Figure 8.1) before they went into clinical practice.

Figure 8.1: Theory session: The nose and sinuses

This session included an overview of the common conditions of the nose and sinuses managed at a primary level of care including:

- A review of the anatomy and physiology of the nose and sinuses
- History taking
- Diagnosis
- Drug and non-drug management
- Health education
- Referral

At the end of this theory session, students were informed that they would only receive one complete activity on their first day in clinical practice due to the challenges identified during the first iteration. This enabled students to plan and collate their responses over the two-day period that they would be in clinical practice. The recording of the video was still included in the planned activities as students indicated that, although challenging, they learned while producing the videos. Students were also informed that they would be allowed to submit their videos in the WMG after their clinical practice days when they have access to free Internet connection at home, university accommodation or on-campus. The deadline was the end of that week. This flexibility around submissions ensured that students were accommodated.

8.2.2 Clinical practice session: Week 4

The first group that went into clinical practice the following Monday received their activity on the WMG around 08h00 in the morning to inform them on the enactment plan for this second iteration. The complete activity for their two days in clinical practice was communicated around 08h30, as illustrated in Figure 8.2.

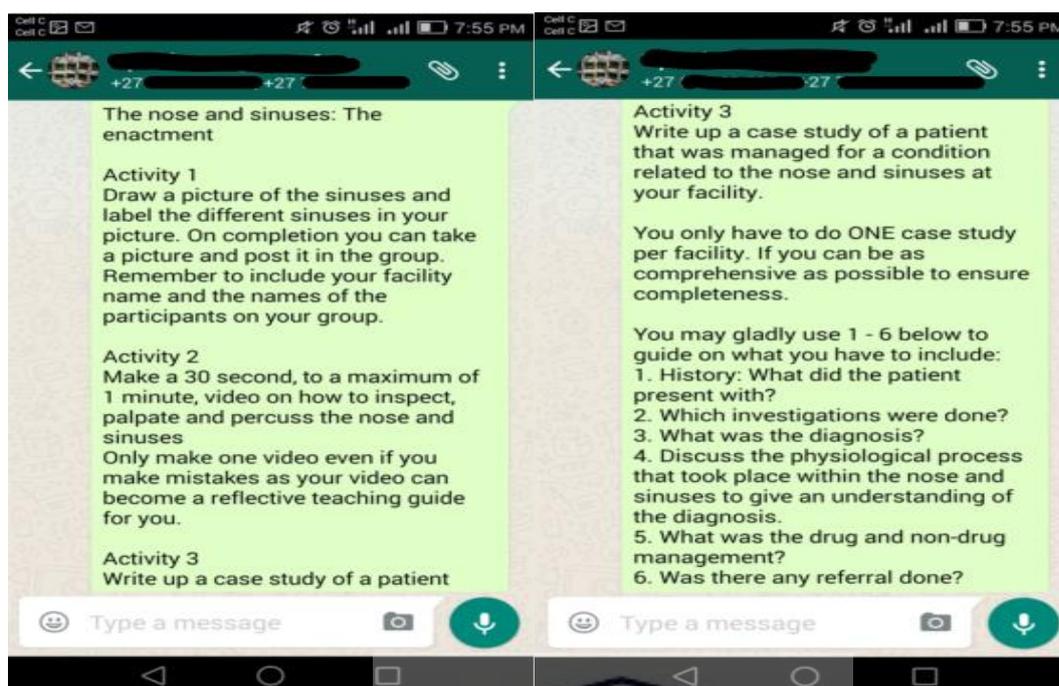


Figure 8.2: Instructions to students on the 2nd iteration

Even though students indicated in their online reflections that insufficient time was allowed for the first iteration, some groups started responding 30–40 minutes after the activities were posted on the WMG, while other groups only started responding around lunch time, as illustrated in Figure 8.3.

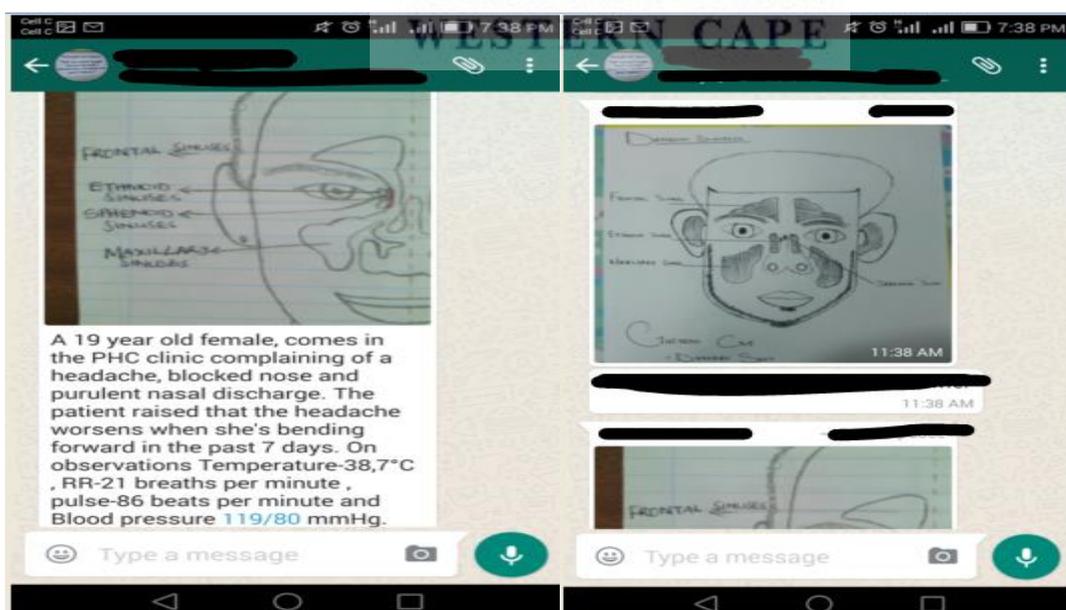


Figure 8.3: Responses from students to their activities

After the second iteration with the first group in clinical practice (Monday/Tuesday group), every interaction within the WMG was once again duplicated and sent to the students that were in clinical practice on Wednesday and Thursday. No changes were made to any of the activities sent to the second group of students.

8.3 REFLECTIONS AFTER THE SECOND ITERATION

Certain themes and sub-themes re-surfaced in the second iteration that is not addressed again in the discussion in Table 8.1. They are related to:

- a great learning platform
- creating videos was time consuming
- technological difficulties
- need for data/airtime/Wi-Fi
- tea and lunchtime issue
- revision helped to comprehend anatomy and physiology
- difficulty to get others to participate

Table 8.1: Second iteration themes and sub-themes supported by affordances of Bower (2008)

THEMES	SUB-THEMES
More positive experiences promoted <i>accessibility</i> 	An improved experience
Working in groups with improved group cohesion enhanced <i>accessibility, link-ability and share-ability</i> 	Creating an educational platform to share knowledge
Communication of tasks in one message improved <i>accessibility and view-ability</i> 	<i>Early distribution allowed time for organisation and completion of tasks</i>

<p>Supportive nursing personnel at clinical facilities promoted <i>link-ability and share-ability</i></p> 	<p>Nursing personnel at clinical facilities became more accommodating when they understood the purpose of the tasks</p>
	<p>Nursing personnel at clinical facilities assisted with completion of tasks</p>
<p><i>Integrate-ability</i> stimulated revision and practice for examinations/tests</p> 	
<p>More time needed to complete tasks impacted <i>accessibility, browse-ability, link-ability and share-ability</i></p> 	<p>Still difficult to participate in WMG while within clinical practice</p>
<p>No rush with activities as enough time was allocated for completion enhanced <i>accessibility, share-ability and integrate-ability</i></p> 	
<p>Challenges experienced with <i>draw-ability</i></p> 	

8.3.1 Theme 1: More positive experiences promoted accessibility

The second iteration was viewed more positively than the first iteration as students had an idea of what to expect after their experiences during the first iteration, thus supporting *accessibility*. The changes made, as guided by the electronic reflections, were positively received by students.

Sub-theme: An improved experience

Students' referred to the all the activities communicated on the first day in clinical practice on the WMG as an improvement on the first iteration. Receiving all the activities on the nose and sinuses on their first day in clinical practice improved group cohesion, which enhanced learning from peers or their MKO.

It was a good experience to work via social media and I liked the fact that us (we as) students were teaching each other. (SRP 3)

We only did the activities on one day. It strengthened our bond and we learned from each other. (SRP 46)

Students experienced the second iteration, with the communication of the activities in one message on their first day in clinical practice, in a more positive light. They preferred this way above one used during the first iteration (various communications at different time intervals). Students also reflected that they enjoyed the improved activities communicated to them.

Jantjies and Joy (2016) highlighted challenges experienced by teachers in schools and how technology can be used to enhance such classrooms. Teachers identified lack of teacher training in ICT use, prevented them from appreciating the possibilities of attaining their teaching objectives using technology (Jantjies & Joy, 2016). Educators and students use mobile technology in diverse contexts for a variety of teaching and learning purposes, for example in discussion forums and when distributing course content (Conejar & Kim, 2014:193). The most effective use of available technology, WhatsApp Messenger, in teaching and learning is important to enhance ITCP.

It can be concluded that the improvements made after the first iteration made it easier for students to adapt to the new m-learning teaching methodology. Group cohesion and learning from peers (the MKO in the group) were enhanced.

Design principle

Not only does flexibility in the improvement of the m-learning intervention afford an improved experience, but the early communication of tasks and more time to complete them furthermore improved group cohesion.

8.3.2 Theme 2: Working in groups with improved group cohesion enhanced “accessibility”, “link-ability” and “share-ability”

Students experienced that working in a group enhanced *accessibility*, *link-ability* and *share-ability* as they had access to one another within the group, making the sharing of information easier. Group work is used to facilitate learning at all levels in most educational organisations, even in higher education. The purpose of students working in groups in educational practice is to serve as an encouragement to learn. Research shows that working collaboratively enhances both

academic achievement and collaborative capabilities (Johnson & Johnson, 2003; Baines, Blatchford & Chowne, 2007; Gillies & Boyle, 2010).

Sub-theme: Creating an educational platform to share knowledge

The WMGs provided students with a platform on which they could view the activity communicated to them and discuss and share views within their group to enhance their educational process through the integration of their theory and clinical practice.

Our group worked well together and we shared our knowledge and opinions. (SRP 30)

Working as a team is much better than working alone. That I've learned through these weekly studies. (SRP 72)

With the WhatsApp mobile communicator helps me a lot, because we end up learning new things. (SRP 61)

While doing this WhatsApp tutorial I love the new experience of adding the latest technology to better our studies. (SRP 82)

Students were motivated to do research on the topics being discussed and clarified uncertainties among themselves (peer facilitation) as “you get different answers from different perspectives” and therefore did not need clarification from educators on the WMG. The accessibility afforded by the WMG thus gave students an opportunity to link to one another to share knowledge, opinions and information using the latest technology. Group cohesion was promoted by establishing WMGs for students to work collaboratively on activities rather than having individual students from the same clinical facility responding to an activity.

I just want to add that, videos, the one that I've seen where the procedure was done incorrectly, that is also videos that can be used as learning. (EFGP 4)

Students can be assisted to develop multiple skills, important in the professional domain, through group projects (Caruso & Woolley, 2008; Mannix & Neale, 2005). Group work was improved and students reflected positively on how they worked together, sharing knowledge, enabled by the m-learning activities using WhatsApp Messenger.

It can be concluded that WhatsApp Messenger provided a platform on which students could learn from their MKO in the group and share opinions and information within a group

context.

Design principle

WhatsApp Messenger affords group work and peer support, improving group cohesion and providing a platform on which to share knowledge.

8.3.3 Theme 3: Communication of tasks in one message improved “accessibility” and “view-ability”

At the start of the second iteration, the tasks related to the nose and sinuses were communicated to students on the first morning of their clinical practice. Students reflected that receiving the communication on the tasks in one message on the WMG, lessened the time spend to access, view, comprehend and complete these tasks.

Sub-theme: Early distribution allowed time for organisation and completion of tasks

Students were positive about the early distribution of all the tasks in one single communication on the WMG.

I also found it better that the work was sent early morning in one single message, that way we could discuss who had to do what (allocate) and get ourselves organised. (SRP 75)

We knew what was expected and did not wonder if another task was coming. (SRP 91)

Students reacted positively to the three tasks communicated at the same time for completion on their first day within clinical practice during the second iteration.

It is believed that the students involved in the group activity should “learn something” while engaged in a group activity. A group can be defined as “pupils working together as a group or a team” (Blatchford, Kutnick, Baines & Galton, 2003; Hammar Chiriatic, 2014).

It can be concluded that, through the communication of a comprehensive and complete activity on their first day in clinical practice, students were afforded enough time to plan and complete the activities over their two days within clinical practice.

Design principle

Timely communication of the entire task (to be completed over a two-day period while in clinical placement) in one message allowed time for organisation and the completion of tasks.

8.3.4 Theme 4: Supporting nursing personnel at clinical facilities promoted “link-ability” and “share-ability”

Reflection on the second iteration indicated that nursing personnel at clinical facilities where students were placed for their clinical practice were more informed about the activities communicated to students on the WMGs. Students experienced that the nursing personnel at facilities became more accommodating with their m-learning activities as they began to understand the purpose of the enactment.

Sub-theme: Nursing personnel at clinical facilities (staff) became more accommodating because they understood the purpose of the tasks

The nursing personnel at the clinical facilities were more accommodating towards students during the implementation of the second iteration as they were more informed about this research study. Students remarked that the nursing personnel at the facilities were more supportive towards them in their completion of the online tasks communicated via the WMG as they had a better understanding of the purpose of their participation.

The second week of the social networking learning has gone better. Staff was more accommodating. (SRP 1)

The nose and sinuses week went off much better. Staff was cooperative and so was the group. (SRP 12)

Having staff understand what we are doing and the purpose thereof has made completing our tasks so much easier. (SRP 86)

The adoption of technology in HEIs requires clear policy guidelines, ensuring device availability and access to technical and pedagogical support. Effective training and administrative and technical support have to be in place to ensure that students and educators have the necessary skills and support to engage with formal digital literacy (Johnson *et al.*, 2014).

Adherence to policy guidelines regarding the use of mobile devices while in clinical placement is important, as is the effective training of the nursing personnel at facilities to support students while engaging with formal digital literacy.

It can be concluded that awareness of this research study made the nursing personnel at clinical facilities where students were placed for their clinical practice more accommodating and cooperative.

Sub-theme: Nursing personnel at clinical facilities assisted with the completion of tasks

At some of the clinical facilities, the nursing personnel were enthusiastically awaiting the tasks to be communicated to students, thereby enabling their participation in the project.

It was an enjoyable task. We received help from the Srs (registered nurses) at (facility name removed) with the drawing & case study which eventually turned out a bit fun as we made fun of each other's drawings (SRP 52)

The support received from nursing personnel at clinical facilities gave students the opportunity to link to and share knowledge in their respective groups. Nursing personnel at certain clinical facilities guided and assisted students with the completion of the tasks. Effective professional development experienced in clinical learning is important in teaching and learning of undergraduate nursing students. A complex and dynamic learning environment is needed to develop clinical competencies and socialisation skills in the nursing profession (Baraz, Memarian & Vanaki, 2015).

It can be concluded that an information session with nursing personnel at clinical facilities, prior to the intervention, would allow an understanding and subsequent support of a m-learning intervention.

Design principle

Preparation of nursing personnel at clinical facilities for a m-learning intervention is important to ensure that students are supported and knowledge shared during students' pursuit of learning enhancement.

8.3.5 Theme 5: “Integrate-ability” stimulated revision and practice for examinations/tests

Students reflected that their experiences during the first iteration prepared them for activities communicated during the second iteration, thus enhancing their *integrate-ability* and allowing them to prepare for their assessments.

The tutorial was very comprehensive and gave a good idea of what was to be expected in the test/exams. The brainstorming forced us to revise the work covered. (SRP 28)

Each activity helped us and by practising them helps us to become more confident for examination purposes and improving our skills. (SRP 30)

Transformation has taken place in clinical facilitation with the use of mobile devices by health care professionals (Aungst, 2013; Ventola, 2014). The use of mobile devices with WhatsApp Messenger facilitated students' revision of anatomy and physiology and they reflected that this helped them to understand the anatomical structures. The activities communicated were viewed as "very educative" and students were kept "active" while in clinical placement.

It can be concluded that preparation for an activity enhances involvement, revision, practice and confidence in applying the appropriate examination techniques of the ENT health assessment.

Design principle

The use of the WhatsApp Messenger application on mobile devices facilitated involvement, revision and practice in preparation for assessments.

8.3.6 Theme 6: More time needed to complete tasks impacted "accessibility", "browse-ability", link-ability" and "share-ability"

During the second iteration, students still identified the need for more time to complete the communicated tasks. Not having enough time impacted their access to the task, being able to browse the task, being able to link with group members and being able to share information on the task.

Sub-theme: Still difficult to participate in WMG while in clinical practice

Students identified that the available time in which to complete the activities communicated on the WMGs while they were within clinical practice was still an issue. There was specific reference to the production of the video to display their examination techniques of the ENT health assessment that was still time consuming and which caused problems with nursing personnel at clinical facilities.

The tasks being sent together did make it easier, but time was still an issue as we were quite busy that day. (SRP 34)

However sometimes I do find that the work is too much to cope with while being in the facilities as we miss out on work that can be learned. (SRP 37)

I think we should get the whole day to do the work because last week the sister in charge was complaining and she said she will complain to our supervisor (clinical facilitator) because she feels that this is clinical time, now we are doing our theory which disturbs us in a way with our clinical because doing these videos consume a lot of time. (SRP 68)

We are there for the students and students have objectives. They've got objectives which need to be completed and given time and space. You had to be more flexible. (EFGP 1)

Flexibility, development of critical thinking and teamwork are principles underpinning a successful programme which enable nurses to identify their individual learning needs (Daly & Burn, 2017). Lecturers and clinical facilitators acknowledged that their clinical teaching strategy needed to be flexible while students were participating in the m-learning research study but said that they still had clinical learning outcomes that had to be completed.

It can be concluded that there has to be some form of consideration for the expected clinical learning outcomes of students while being required to participate in a simultaneous m-learning activity.

Design principle

Flexibility in dealing with communicated tasks should be considered during a m-learning intervention.

8.3.7 Theme 7: No rush with activities as enough time was allocated for completion enhanced “accessibility”, “share-ability” and “integrate-ability”

It would appear that some students experienced that during the second iteration they had enough time available to complete the tasks communicated on the WMG. Therefore, their time to access the task, being able to share knowledge with their group and thus the integration of their theory and clinical practice, were enhanced.

Sub-theme: No rush with activities as enough time was allocated for completion

Students viewed that the second iteration was more accommodating as they had time to complete their tasks when their work was done and that the task completion was not limited to their tea and lunchtime.

This tutorial was very nice because we had a lot of time to do it so we did not have to rush for time. (SRP 5)

It was accommodating. It gave us enough time to complete and as always very informative. (SRP 43)

It can be concluded that being flexible about the deadline for the task completion is the key to success in a m-learning activity.

Design principle

Flexibility around the submission deadline reduces pressure on students as it allows for the completion and submission of tasks when possible.

8.3.8 Theme 8: Challenges experienced with “draw-ability”

Students experienced the activity in which they were asked to draw the nose and sinuses as challenging, stating that they were not good at drawing or unable to draw.

It was good and interesting but the drawing part it was a challenge to me because I cannot draw. (SRP 42)

Last week's tutorial was a bit challenging "in a good way though" since we had to draw the sinuses, in my facility as the (facility name removed) group we at first struggled to draw the sinuses but at the end we managed to. (SRP 80)

However, students reflected more positively on the second iteration as they were better prepared and had more time to complete the tasks due to early communication of activities. They were able to practice their skills, brainstorm and respond to the comprehensive activity communicated. Students found the activities more interesting, reflecting that “*the drawing of the pictures actually increased our learning opportunity*”.

It can be concluded that unless students received prior training in drawing activities, they should not be required to draw as they were either not good at drawing or unable to draw at all.

Design principle

The creative abilities or competencies of students have to be considered when planning a m-learning intervention.

The following is a presentation of the further refinement of the draft design principles that informed the first iterative cycle, which, in return, informed the second iterative cycle (Table 8.2).

Table 8.2: Refinement of the draft design principles in the first and second iteration

DRAFT DESIGN PRINCIPLES (DDP) IDENTIFIED AS RULES IN THE EXPLORATORY PHASE IN CHAPTERS (CH) 3, 4 AND 5	DRAFT DESIGN PRINCIPLES SUPPORTED BY THE AFFORDANCES (BOWER, 2008)	FIRST ITERATION REFINEMENT	SECOND ITERATION REFINEMENT
Social interaction plays an important role in the cognitive development of the student, as outlined by social constructivism of Vygotsky (1978), a theoretical underpinning of this study. (CH 3: DDP 10)	Acknowledge the role of social interaction in the cognitive development (<i>accessibility, link-ability</i>) of the student.	WhatsApp Messenger is an innovative educational platform used to motivate students and encourage their participation in learning course content to achieve course outcomes.	
Situating learning is the appropriate learning theory with the constructivist epistemological orientation that indicates the role of the student (learner), lecturer and clinical facilitator (instructor) and the implications for instruction. (CH 3: DDP 9)	Identify an appropriate learning theory, e.g. situated learning (<i>reliability</i>).	Learning tasks should be designed to promote group participation and encourage dialogic and collaborative student learning.	
		Establishing the rules of engagement and group norms and values could increase a sense of responsibility for completing tasks together at an agreed-upon time.	
The nine characteristics of the authentic learning are important for establishing knowledge and skill within a real-life setting. (CH 3: DDP 13)	Illustrate the application of the nine characteristics of authentic learning, supported by flexible and blended learning environments aimed at enhancing students' online learning	WhatsApp Messenger, the m-learning platform for engagement, can be used to review and assess prior knowledge.	WhatsApp Messenger, the m-learning platform for engagement, can be used to review and assess prior knowledge.

	experiences (Chapter 3; Table 3.5) (Characteristics of authentic learning applied: <i>accessibility, link-ability, write-ability, readability, view-ability, speak-ability, listen-ability and share-ability</i>).	Providing a blended learning environment while students have free Internet access on-campus should be included in m-learning initiative.	Providing a blended learning environment with free Internet access while students are on-campus should be included in m-learning initiative.
Every individual student learns to use the social media application on their mobile devices at any time or any place to suit their learning needs in a flexible learning environment. (CH 3: DDP 2, 3, 8 & 14; CH 4: DDP 5; CH5: DDP 2)		Being flexible about the completion of the communicated tasks is important to enhance continued participation in a m-learning intervention.	Flexible improvement of the m-learning intervention does not only afford an improved experience, but the early communication of tasks (more time to complete them) also increased group cohesion.
A combination of face-to-face and online learning experiences, blended learning, creates an interactive learning platform. (CH 3: DDP 15)		WhatsApp Messenger, a m-learning platform for engagement, can be utilised for discussions and responses in real-time to enhance learning.	WhatsApp Messenger, a m-learning platform for engagement, can be utilised for discussions and responses in real-time to enhance learning.
Preparation of all students and lecturers and clinical facilitators for an authentic WhatsApp Messenger ensures the success of a m-learning intervention. (CH 3: DDP 5 & 3; CH 4: DDP 4; CH 5: DDP 2)	Introduce a blended learning approach to prepare students and lecturers and clinical facilitators for an online m-learning intervention using WhatsApp Messenger (<i>accessibility, write-ability, readability, view-ability, speak-ability</i>	Sufficient training and instruction should precede online tasks, communicated during a m-learning intervention and focused on the need and practicality of the learning task.	
Cultivate a positive attitude towards the use of		Different multimodal possibilities, for	

personal mobile devices for a m-learning intervention. (CH 4: DDP 7 & 8)	<i>and listen-ability</i>).	example video or digital recordings, should be offered to students to represent their learning using mobile devices.	
Social interaction among students includes the MKO and the ZPD (the two main principles underlying the Vygotskian Framework) supports cognitive development. (CH 3: DDP 10)	Acknowledge the role of the MKO in peer support (<i>accessibility, link-ability, speak-ability and listen-ability</i>).	The WMGs enhanced peer support by creating a collaborative online working environment.	WhatsApp Messenger affords group work and peer support, improving group cohesion and providing a platform on which to share knowledge.
Interactive and collaborative learning opportunities are extended by students consulting peers, the MKO and as a resource, within a WhatsApp Messenger group after hours. (CH 3: DDP 7; CH 5: DDP 19 & 21)			
The LMS of the HEI offered on the Sakai platform, iKamva, could be actively used to engage in discussions and share documents. (CH 5: DDP 23)			
Students should summarise and present an actual case (with real-life images) managed in clinical facilities, and an example of how to formulate a case study should be provided. (CH 5: DDP 25 & 26)	Acknowledge the importance of the preparation and presentation of an actual case study to enhance learning (<i>accessibility, link-ability, speak-ability and listen-ability</i>).	M-learning activities using WhatsApp Messenger could be used to promote students' self-study through researching communicated activities and discussing them with peers and lecturers and clinical facilitators.	
Learning using mobile devices, focused on certain	Allow students to learn using the	Learning tasks that incorporate the	

<p>common conditions within in the clinical facility, is implemented on both prepared cases or case studies and an actual case. (CH 5: DDP 18, 25 & 26)</p>	<p>functions on their mobile devices at any time or any place to suit their individual learning needs (<i>accessibility, link-ability, write-ability, readability, view-ability, speak-ability, listen-ability and share-ability</i>)</p>	<p>functions available on mobile devices, e.g. creating videos, can be used to reflect the integration of theory and practical skills acquired while in clinical practice.</p>	
<p>Resources are available during a m-learning intervention to combat challenges to access library search engines off-campus. (CH 4: DDP 6; CH 5: DDP 15 & 22)</p>	<p>Provide resources during a m-learning intervention to counteract challenges in accessing library search engines off-campus (<i>accessibility, share-ability, link-ability, readability and view-ability</i>).</p>		
<p>WMGs are established for every clinical facility to enhance interactive and collaborative communication and to ensure that all students have access to the same amount of information. (CH 3: DDP 6; CH 5: DDP 9, 10 & 17)</p>	<p>Establish WMG's to enhance interactive and collaborative communication and to ensure that students have access to the same amount of information (<i>accessibility, link-ability, write-ability, readability, view-ability, speak-ability, listen-ability and share-ability</i>).</p>		
<p>Mobile devices are used as a resource to create an open-door policy between lecturers and clinical facilitators and their students. (CH 5: DDP 22)</p>			
<p>As part of their workload, professional nurses in clinical facilities should accommodate students and provide guidance on clinical skills. (CH 5: DDP 15)</p>			

<p>Provide opportunities for visualisation and interaction with learning content by using personal mobile devices e.g. WhatsApp Messenger (BYOD). (CH 3: DDP 4 & 12; CH 5: DDP 3 & 4)</p>	<p>Prompt students with online tasks communicated via WhatsApp Messenger (<i>accessibility, link-ability, write-ability, readability, view-ability, speak-ability, listen-ability and share-ability</i>).</p>	<p>Timeous submission of group tasks or assessments should be viewed as an important component of the m-learning initiative, with the understanding that students may experience poor network access and that submissions might be delayed.</p>	<p>Timely communication of the task to be completed over a two-day period while in clinical placement and communication of tasks in one message allowed time for organisation and completion of tasks.</p>
<p>WhatsApp Messenger, a mobile messaging application, should be used in a m-learning intervention as it allows for immediate responses in real-time. (CH 4: DDP 11 & 12; CH 5: DDP 5, 6 & 7)</p>			
<p>The use of a smartphone, with its technological advances, is a mode of communication to enhance ITCP. (CH 3: DDP 1; CH 4: DDP 1, 10 & 14; CH 5: DDP 1 & 2)</p>	<p>BYOD to participate in an online m-learning intervention using WhatsApp Messenger as the mode of communication to enhance ITCP (<i>accessibility, link-ability and share-ability</i>).</p>	<p>The consequences of plagiarism should be highlighted in an online m-learning intervention.</p>	
<p>It has value to BYOD in order to participate in a m-learning research study (inclusion criteria). (CH 5: DDP 8).</p>			
<p>Technical support should be in place during a m-learning intervention, even if participants know how to use their mobile devices effectively. (CH 4: DDP 1, 2 & 3)</p>	<p>Provide technical support to students and lecturers and clinical facilitators should they experience challenges with their mobile devices (<i>accessibility</i>).</p>	<p>Technical support should be offered to participants in m-learning interventions.</p>	<p>Technical support should be offered to participants in m-learning interventions.</p>
<p>Mobile technology offers cheaper and effective communication and post-Web 2.0 pedagogical</p>	<p>Prompt students to explore the online learning activity to enhance their</p>		

<p>affordances for teaching and learning that enable engagement with students through Internet connectivity, mobility, geolocation and social networks. (CH 3: DDP 11; CH 4: DDP 9 & 13; CH 5: DDP 11 & 12)</p>	<p>learning using WhatsApp Messenger (<i>accessibility, link-ability, write-ability, readability, view-ability, speak-ability, listen-ability and share-ability</i>).</p>	<p>Good network coverage and access to free Wi-Fi are important components of a successful m-learning initiative.</p>	
<p>The best time for a m-learning intervention is at any available time as guided by students and lecturers and clinical facilitators. (CH 4: DDP 5; CH 5: DDP 16 & 20)</p>	<p>Communicate learning tasks within the identified time frame (<i>accessibility, link-ability, write-ability, readability, view-ability, speak-ability, video produce-ability and share-ability</i>).</p>	<p>Learning activities should be scheduled at a time suitable to both the students and the clinical facility to minimise challenges with participation as producing videos can be time consuming.</p>	<p>Learning activities should be scheduled at a time suitable to both the students and the clinical facility to minimise challenges with participation as producing videos can be time consuming.</p>
<p>Upholding professionalism during a m-learning intervention includes professional and ethically correct conduct; respecting boundaries regarding cell phone policies of clinical facilities and obtaining permission for a m-learning intervention. (CH 5: DDP 13, 14, 15, 16, 21 & 24)</p>	<p>Motivate students to uphold professionalism while in clinical practice facilities (<i>reliability and focus-ability</i>).</p>	<p>All facility nursing personnel involved in student learning should be included in a workshop in which ground rules regarding the use of mobile devices in clinical facilities, supported by facility policies on cell phone usage, are discussed.</p> <p>In health facilities, adherence to facility policies on cell phone usage while working with patients is of importance.</p>	

The data analysis and subsequent discussions of the themes and sub-themes identified after the second iteration – based on electronic reflections received from students and lecturers and clinical facilitators – informed improvements to be made to the third and final iterative cycle of the enactment phase.

Table 8.3: Recommended improvements for iteration three

2 nd Iteration challenges identified	Recommendations: 3 rd Iteration
More time needed to complete tasks impacted <i>accessibility, browse-ability, link-ability and share-ability</i> .	Making of a video will be excluded as students still experienced time challenges when participating in WMG while in clinical practice.
Challenges experienced with <i>draw-ability</i> .	Flexibility in tasks displaying examination techniques of the ENT health assessment will have to be revisited.

8.4 THE THIRD ITERATION: THE MOUTH AND THROAT

8.4.1 Theory session: Week 5

The session started with a review of the perceptions of students during the second iteration of the nose and sinuses. Students were verbally informed about the online reflections received on the activities using WhatsApp Messenger and the improvements that will be made to the third and final iteration. The pictures that had to be drawn to display the anatomy of the nose and sinuses elicited laughter and students humorously identified their “*shortcomings as artists*”. Students received a theory session in class on-campus on the mouth and throat using PowerPoint slides (Figure 8.4) before they went into clinical practice.

THE MOUTH AND THROAT

28 APRIL 2016
03 MAY 2016

LEARNING OUTCOMES

At the end of this session you have to be able to demonstrate an understanding of:

- Structure and physiology of the mouth and throat
- Principles of assessment of the mouth and throat
- How to gather information subjective/objective
- Common conditions related to the mouth and throat
- Other signs/symptoms of common conditions of the mouth and throat
- Management strategies
- Prevention/health education (HCE)
- Professional health boundaries
- Reflection

ROOF OF THE MOUTH AND PHYSIOLOGY OF THE MOUTH & THROAT

MOUTH & SALIVARY GLANDS

PHYSIOLOGY

- 800-1000 saliva/mouth
- submandibular gland
- sublingual gland
- parotid gland
- salivary gland

CASE STUDY

Sheila has been coming to consulting with a very painful throat. On examination:

- Temperature 38 degrees Celsius, Pulse 92 beats per minute, Blood pressure 110/80, Respiration 18 breaths per minute.
- On inspection tonsils red and enlarged with red white patches on
- On palpation swelling both sides of neck

CASE STUDY SUMMARY

Subjectively: Sheila, a 28-year-old female, complaining of a very painful throat.

Objectively: She has been coming to consulting with a very painful throat.

- On inspection tonsils red and enlarged with red white patches
- On palpation swelling both sides of neck
- Other signs as follows:

Temperature	Respiration	Pulse (b/min)	Blood Pressure
38°C	18 breaths/min	92 b/min	110/80 mmHg

SPECIFIC HISTORY TAKING QUESTIONS

- Do you have lesions in the mouth/tongue/gums?
- Does your throat/tonsils get sore often, when do they start?
- Is it associated with cough, fever, swollen glands, headache or sore throat?
- Do you bleed gums when brushing?
- Do you have a sore throat?
- Do you have any other symptoms, like swollen glands, or a sore throat?
- Do you have any other symptoms, like swollen glands, or a sore throat?
- Do you have any other symptoms, like swollen glands, or a sore throat?

EXAMINATION TECHNIQUES: INSPECTION AND PALPATION OF THE OROPHARYNX

Inspection: observe the oral cavity, tongue, tonsils, and throat.

Palpation: touch the oral cavity, tongue, tonsils, and throat.

VIDEO PRESENTATIONS ON THE EXAMINATION OF THE MOUTH AND THROAT

- Examination of the mouth and throat 01
- Examination of the mouth and throat 02
- Examination of the mouth and throat 03
- Examination of the mouth and throat 04
- Examination of the mouth and throat 05

EXAMINATION TECHNIQUES: INSPECTION OF THE TONGUE

- Look for signs of dehydration and swollen parotid glands
- Look for signs of infection
- Look for signs of trauma
- Look for signs of systemic disease
- Look for signs of oral cancer
- Look for signs of oral leukoplakia
- Look for signs of oral lichen planus
- Look for signs of oral candidiasis
- Look for signs of oral herpes
- Look for signs of oral syphilis
- Look for signs of oral tuberculosis
- Look for signs of oral sarcoidosis
- Look for signs of oral actinomycosis
- Look for signs of oral histiocytosis
- Look for signs of oral eosinophilic granulomatosis
- Look for signs of oral lymphoma
- Look for signs of oral carcinoma

EXAMINATION TECHNIQUES: INSPECTION AND PALPATION OF THE OROPHARYNX

Inspection: observe the oral cavity, tongue, tonsils, and throat.

Palpation: touch the oral cavity, tongue, tonsils, and throat.

DIAGNOSIS: BACTERIAL TONSILITIS

COMMON CONDITIONS MANAGED AT PHC

- ORAL THRUSH
- BACTERIAL TONSILITIS
- STOMATITIS
- HALITOSIS

DESCRIPTION AND MANAGEMENT

CLASS EXERCISE

PLEASE GO TO YOUR PHC CLINICAL GUIDE ON YOUR MOBILE DEVICE

REFERENCES

- Health Services of South Africa (HSA), 2016. HCE Clinical guidelines: mouth and throat.
- Health Services of South Africa (HSA), 2016. HCE Clinical guidelines: mouth and throat.
- Health Services of South Africa (HSA), 2016. HCE Clinical guidelines: mouth and throat.
- Health Services of South Africa (HSA), 2016. HCE Clinical guidelines: mouth and throat.
- Health Services of South Africa (HSA), 2016. HCE Clinical guidelines: mouth and throat.

Figure 8.4: Theory session: Mouth and throat

This session included an overview of the common conditions of the mouth and throat managed at a primary level of care, including:

- review of anatomy and physiology;
- history taking;
- diagnosis;
- drug and non-drug management;
- health education; and
- referral.

8.4.2 Clinical practice session: Week 6

Preparation for the third and final iteration was easier than the preparation for the initial iteration. As per norm, the first group that went into clinical practice the following Monday received their activity on the WMG around 09h00 in the morning to inform them of the enactment plan for this third and final iteration (as illustrated in Figure 8.5). The complete activity for the two days that students would be in clinical practice was communicated.

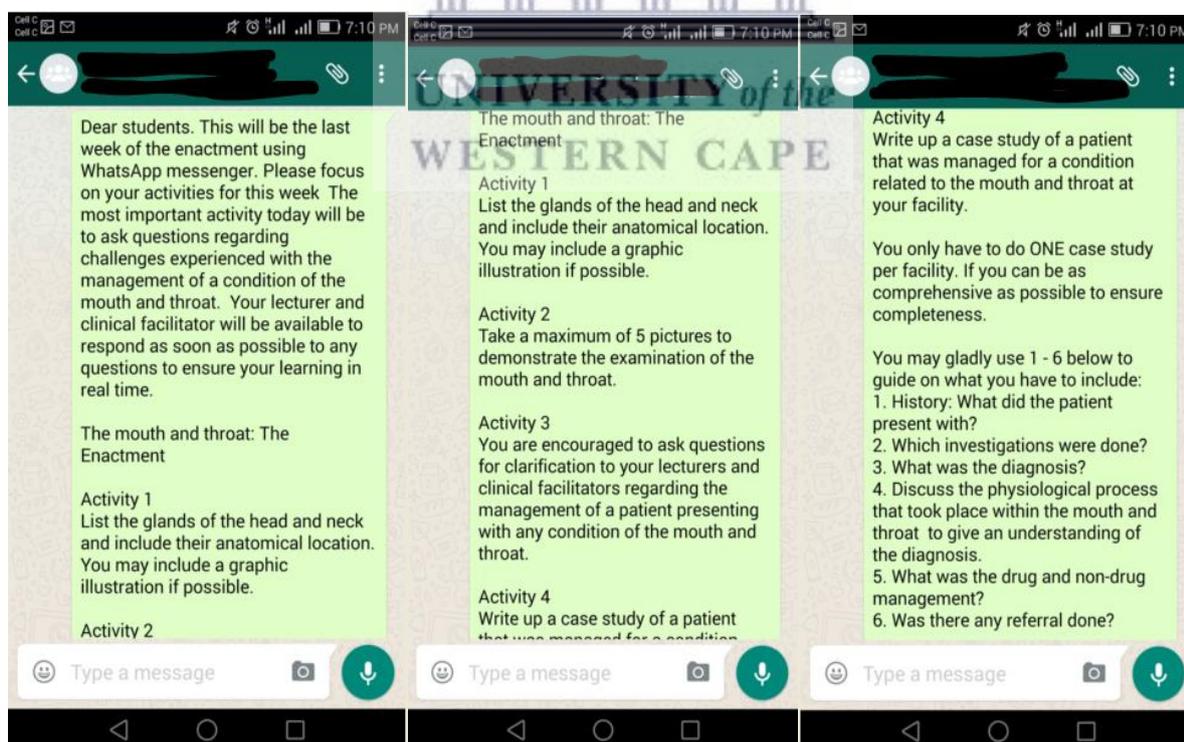


Figure 8.5: Third iteration instructions

The first group that went into clinical practice the following Monday received their activity on the WMG at around 08h00 in the morning to inform them of the enactment plan for this third iteration. The complete activity for the two days while in they would be within clinical practice was communicated at around 08h30 (as illustrated in Figure 8.5). Students started to respond to the activity soon after it was communicated, as illustrated in Figure 8.6.

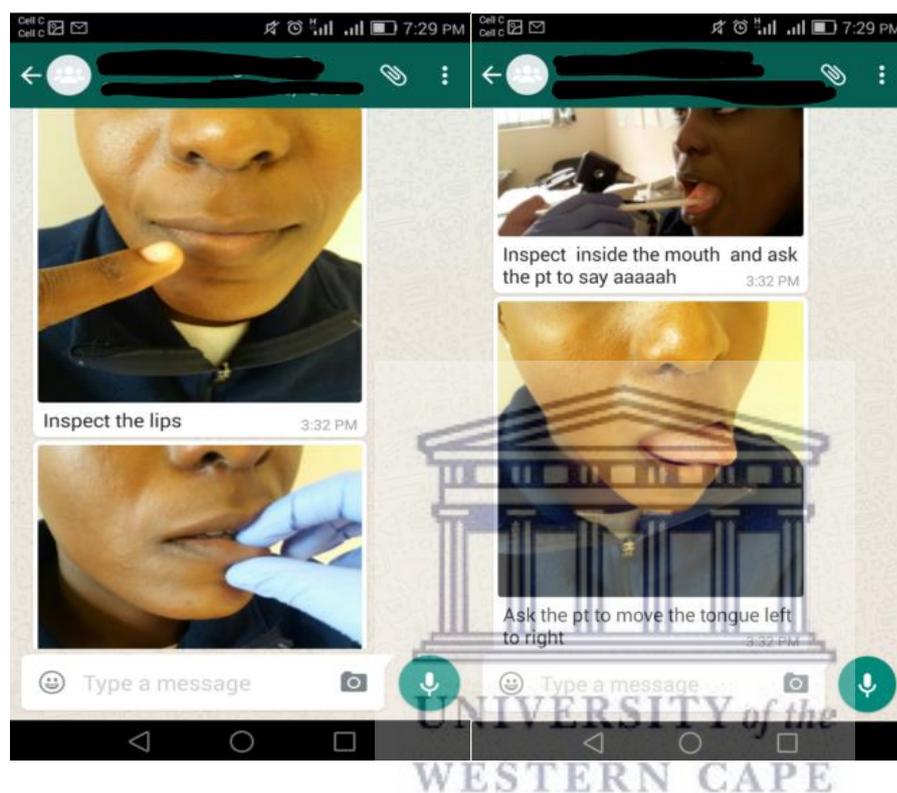


Figure 8.6: Pictures on the examination of the mouth & throat

Figure 8.6 is a representation of students demonstrating the examination of the mouth and throat. For the third iteration, students were requested to take pictures rather than make videos as students still experienced challenges with sending videos during the second iteration due to Internet access challenges. Even though accommodations were made during the second iteration, students still reflected on challenges experienced. During the third iteration, as with the first and second iteration, every interaction on the WMG on the Monday and Tuesday was once again duplicated with the students that were in clinical practice on Wednesday and Thursday. No changes were made to any of the activities during the third iteration with the second group of students.

8.5 REFLECTIONS AFTER THE SECOND ITERATION CYCLE

- need for data/airtime/Wi-Fi (1st & 2nd iteration)
- facility was too busy (1st & 2nd iteration)
- working in groups enhanced *accessibility, link-ability and share-ability* (1st & 2nd iteration)
- *integrate-ability* allowed preparation for the exam/test (2nd iteration)
- preparedness for the tasks enhanced *combinability and integrate-ability* (2nd iteration)
- permission-ability proved to elicit ethical challenges (1st iteration)
- m-learning is effective (1st iteration)
- supportive nursing personnel at clinical facilities (staff) promoted *share-ability and link-ability* (2nd iteration)
- need for more time to complete the task impacted *accessibility, browse-ability, link-ability and share-ability* (1st & 2nd iteration)
- early distribution of tasks was helpful (2nd iteration)

Table 8.4: Third iteration themes and sub-themes supported by affordances of Bower (2008)

THEMES	SUB-THEMES
<p>Affordances offered for m-learning included <i>accessibility, readability, write-ability, video-production-ability and integrate-ability</i>.</p> 	<p>An innovative and exciting way to enhance learning.</p> <p>M-learning saves time and affords quick responses to communication.</p> <p>Challenged personal abilities.</p>
<p><i>Video-production-ability</i> afforded the improvement of clinical skills.</p> 	<p>Repetition in making of videos improved clinical skills.</p>
<p><i>Share-ability</i> was improved when pictures were taken (an affordance: <i>picture-production-ability</i> would have been appropriate).</p>	<p>Taking and presentation of pictures was less time consuming.</p>

	
<p>Third week was easier thus promoting <i>accessibility</i>, <i>readability</i>, <i>write-ability</i>, <i>share-ability</i> and <i>integrate-ability</i>.</p> 	<p>Enjoyed applying theory to clinical practice.</p>

8.5.1 Theme 1: Affordances offered for m-learning included “accessibility”, “readability”, “write-ability”, “video-production-ability” and “integrate-ability”

Students indicated that the WhatsApp Messenger m-learning intervention enhanced their learning through the creation of a platform that saved time and offered affordances that included *accessibility*, *readability*, *write-ability*, *video-production-ability* and *integrate-ability*.

A study by Hashim, Tan and Rashid (2015) on the influence of motivational determinants indicates that adult learners’ intention to adopt m-learning is influenced by cognitive, affective and social needs. The study also ascertained that adult learners have a strong preference for adopting m-learning to enhance their learning.

Sub-theme: An innovative and exciting way to enhance learning

Students’ experience of the m-learning intervention was positive. They expressed that the m-learning platform was a good learning platform worth adopting, as it promoted group learning and enabled learning to continue while off-campus. The discussion forum was furthermore found to be very insightful and mentally stimulating. One student reflected that the enactments communicated using WMGs will be missed as this was the third and final iteration of the study. One very positive reflection was that the enactments did not feel like “*school work*”.

Thank you for this learning experience by a way of integrating theory into practice using mobile devices instead of carrying notes and notes to my clinical workplace. (SRP 12)

The questions asked related to the mouth and throat was relatively fair as we covered most of those in the presentation the week before. So we actually had a chance to integrate theory with practice. (SRP 41)

My experience on that m-learning was fun, it did not feel like I was doing school related work, it was interesting. (SRP 48)

These cases are both informative and enjoyable. (SRP 95)

Students viewed that using a m-learning platform afforded them the opportunity to learn while off-campus and activities helped them to integrate their theory and clinical practice “while the theory was freshly understood”. It was reflected that the study assisted with “integrating theory into practice using mobile devices instead of carrying notes and notes to my clinical workplace” and it should be continued in future with other students. One participant remarked that “the discussion was very insightful and mentally stimulating”.

Students were inspired by the m-learning enactment and they acknowledged that learning took place even though it was perceived as doing “gaming” on their mobile device. However, someone requested that the activities should be communicated using the WMGs while students were on-campus due to the availability of free Wi-Fi.

On this week's tutorial I have personally learned a lot of new things not really new but I must say I never really got to know them, maybe because this time around it came like a game and it had to be on the phone that made it all easy to understand. (SRP 67)

The WhatsApp tutorials are a great idea although I would suggest we complete it on-campus rather than being in a clinical environment due to the availability of Wi-Fi. (SRP 76)

The m-learning afforded students with a “fun”, “very insightful and mentally stimulating” learning platform that enhanced ITCP while off-campus (following a theory session on-campus) and should be continued with other students in the future. Koohestani, Soltani Arabshahi, Fata and Ahmadi (2018) identify an increase in skill competency would be reliant on the intervention when exploring the educational effects of mobile learning on students in medical sciences.

It can be concluded that WMG activities were viewed as games, which enhanced learning and participation in the m-learning activity. They should be conducted on-campus as there is free access to Wifi.

Design principle

The online developer must ensure that activities are innovative and exciting to invite student

participation.

Sub-theme: M-learning saved time and afforded quick responses to communication

M-learning activities on the mouth and throat were perceived as a good learning experience that should be continued as a teaching and learning practice. The present-day connection between the m-learning activity communicated and the clinical learning outcomes of the students was valued, as was the fact that communication using the WMG was considered easy and fast. Students also reflected positivity on the continuation of their learning involving their peers and lecturers and clinical facilitators outside of the classroom.

It is a very good experience leaning (sic) via mobile it save time when you are used to it, and you can answer anytime there is no time slot allocated. (SRP 17)

It exposed us know our work as the technique was part of the scope of practice and was so easy and fast to send the work and easy to receive the feedback. (SRP 8)

Mobile study was our 1st experience to engage with other peers and also you as our lecturer (lecturer or clinical facilitator) besides being in the classroom. (SRP 44)

Students viewed that it was “easy” to learn using their mobile devices as sending and receiving of messages was “fast” and thus saved time and enabled an “answer anytime” as there was “no time slot allocated”.

Personalised academic social support affords students with social interaction with others within a m-learning enactment with the increase in information and communication technology and health information systems. Social interaction enables ubiquitous learning with knowledge transformation as the subsequent result (Adenuga, Kekwaletswe & Coleman, 2015). Research results of a study on student perceptions on learning with mobile tablets indicated that mobile technology supports collaborative learning environments and created an opportunity for students to discuss concepts, debate questions and to collaboratively build knowledge (Rossing, Miller, Cecil & Stamper, 2012).

It can be concluded that m-learning afforded student’s access to an easy-to-use, fast and open line of communication with their peers and lecturers and clinical facilitators.

Design principle

Timely communication and submission of group tasks during a m-learning initiative saves time and affords quick responses by establishing an open line of communication between peers and lecturers and clinical facilitators.

Sub-theme: Challenged personal abilities

Students identified that the m-learning intervention challenged their personal abilities as they had to learn a new technique to interact with their learning or module content and work under pressure. However, the m-learning enactment gave students an opportunity to clarify unanswered questions, enabling their understanding of a disease profile that made making a diagnosis and management easier.

I have learn a lot of new techniques, better ways to interact with people and how to work under pressure as well. (SRP 50)

This tutorial has really been an interesting and knowledgeable one. It helped me with unanswered questions. Offered me an opportunity to challenge myself and try and answer the questions to the best of my ability. (SRP 71)

Innovation in healthcare through mobile health have the potential to improve access to and equity in healthcare, but to achieve this, all relevant stakeholders have to be involved (Lemaire, 2011).

It can be concluded that the m-learning intervention challenged students to clarify unanswered questions concerning disease profiles, enabling correct diagnosis and management of a patient.

Design principle

WhatsApp Messenger creates a collaborative online working environment and support system, which improves group cohesion.

8.5.2 Theme 2: “Video-production-ability” afforded the improvement of clinical skills

The production of videos was encouraged to allow students to demonstrate their examination skills during the health assessment and provided them with a recording that could be reviewed when needed. As time challenges were experienced during the 1st and 2nd iterations, the video

making was replaced with picture taking during the 3rd iteration to demonstrate their examination skills during the health assessment of the mouth and throat.

Sub-theme: Repetition in making of videos improved clinical skills

Students reflected that they missed having to make the videos to demonstrate their examination skills during the health assessment. The revision afforded by the production of videos boosted their confidence while they recreated the videos (until perfect in their view) and they found the production of the video very entertaining.

On presating (presenting) and making vedeos (videos) made us gain confidence, it's a good study because it make us learn so much and also to us it's like a revision on our studies. (SRP 9)

Miss having to record a demo video on the mouth as it the previous weeks was so entertaining. (SRP 31)

Great promises for global health-related diagnostic purposes are embedded in the current innovative practices within the area of mobile and connected health (Lundin & Dumont, 2017).

It can be concluded that, even though time consuming, students thought that repetition while making the videos to display their examination skills was entertaining and good revision. It furthermore boosted their confidence in the execution of the required skill.

Design principle

When developing a m-learning intervention, the value of the educational instruction needs to be considered before changes are made. Repetition was identified to have improved clinical skills.

8.5.3 Theme 3: “Share-ability” was improved when taking pictures. An affordance: “picture-production-ability” would have been appropriate.

The study afforded picture-production-ability (not an affordance stipulated by Bower, 2008) and the sharing of pictures enhanced the understanding of the assessments.

Sub-theme: Taking and presentation of pictures less time consuming

Students were positive about taking pictures to demonstrate their examination skills during the health assessment rather than making a video, as the task took less time to complete.

It also helped me a lot as I got to understand the assessment better when we were taking pictures. It did not take much time for us to finish the task. (SRP 54)

It gave me an opportunity to do some revision for the test and taking the picture took up less time than making a video. (SRP 76)

WhatsApp Messenger was once again referred to as an easier way to study as students have their mobile devices with them all the time. Students indicated that, although taking photos took less time than making the videos, there was still not enough time to ask clarifying questions about any clinical challenges as requested during the workshop. Gon and Rawekar (2017) summarises that WhatsApp Messenger works across multiple platforms and is widely used among undergraduate students to send multimedia messages including photos, videos, digital recordings and simple text messages.

It can be concluded that it was easier for students to take pictures than to make videos, yet they did not have enough time to ask clarifying questions about any clinical challenges experienced.

Design principle

WhatsApp Messenger could be used to take and share pictures, illustrating examination skills which proved to be less time consuming than creating videos.

8.5.4 Theme 4: Third week was easier, thus promoting “accessibility”, “readability”, “write-ability”, “share-ability” and “integrate-ability”

Students experienced that the third and final iteration of the enactment was easier, thus affording them with time to access, read, write, share and integrate activities that were communicated via WhatsApp Messenger.

Sub-theme: Enjoyed applying theory to clinical practice

By the third week and third iteration, students identified that they had enough time to apply their theory to their clinical practice as they saved time not having to produce videos. They were therefore able to complete tasks even though the clinical facility was busy. One student identified that they were becoming acquainted with the m-learning activities communicated via WhatsApp Messenger. It was, however, identified that students “*missed*” producing a video.

This week everything went much smoother, and we used our time given efficiently. And we found it less challenging due to not having to make a video. (SRP 27)

Although I do miss making the video, it was really fun. Third time is the charm, so by then we already knew what was expected. (SRP 33)

This week the assignments handed to us were much more easier... not too sure if the tasks were made more easier or if I'm getting use the to the social media activities. In my opinion the latter is in order. (SRP 41)

Smartphones permeated and changed the education platform with the increased use of WhatsApp Messenger by educators and their students to support the learning process through direct access to online learning resources. The availability of a facilitator and the affordance of learning anytime anywhere have made WhatsApp Messenger a convenient tool for enhancing teaching and learning (Gon & Rawekar, 2017).

It can be concluded that, with the changes made based on the reflections after every of the three iterations and because they became familiar with the m-learning platform, the m-learning activities became easier for students.

Design principle

Technical difficulty may be experienced during a new m-learning intervention, thus the importance of technical support is emphasised.

8.6 RECOMMENDATIONS FOR FINAL REFINEMENT

With all the affordances of m-learning identified, it is evident that mobile devices have the potential to facilitate a new era of learning. The m-learning enactment using WhatsApp Messenger as the mode of communication allowed real-time communication of activities and responses on the activities from students and the submission of videos portraying clinical examination skills of the ENT health assessment. The social space enhanced peer support and group cohesion and promoted learning. Table 8.5 indicates how the draft design principles were refined during the three iteration cycles.

Table 8.5: Refinement of draft design principles over three iterative cycles

DRAFT DESIGN PRINCIPLES (DDP) IDENTIFIED AS RULES IN THE EXPLORATORY PHASE IN CHAPTERS (CH) 3, 4 AND 5	FIRST ITERATION REFINEMENT	SECOND ITERATION REFINEMENT	THIRD ITERATION REFINEMENT
Social interaction plays an important role in the cognitive development of the student, as outlined by social constructivism of Vygotsky (1978) and as a theoretical underpinning of this study. (CH 3: DDP 10)	WhatsApp Messenger is an innovative educational platform used to motivate students and encourage their participation in learning course content and achieve course outcomes.		The online developer must ensure that activities are innovative and exciting in order to elicit student participation.
Situating learning is the appropriate learning theory, with the constructivist epistemological orientation that indicate the role of the student (learner), lecturers and clinical facilitators (instructor) and the implications for instruction. (CH 3: DDP 9)	Learning tasks should be designed to promote group participation and encourage dialogic and collaborative student learning.		When developing a m-learning intervention, the value of the educational instruction needs to be considered before changes are made.
	Establishing the rules of engagement (including group norms and values) could increase a sense of responsibility to complete tasks together at an agreed-upon time.		Repetition was identified to have improved clinical skills.

It is important to use the nine characteristics of the authentic learning that establish knowledge and skill within a real-life setting. (CH 3: DDP 13)	WhatsApp Messenger, the m-learning platform for engagement, can be used to review prior knowledge and prepare for exams.	WhatsApp Messenger, the m-learning platform for engagement, can be used to review prior knowledge and prepare for exams.	WhatsApp Messenger, the m-learning platform for engagement, can be used to review prior knowledge and prepare for exams.
	Providing a blended learning environment while students have free Internet access on-campus should be included in m-learning initiative.	Providing a blended learning environment while students have free Internet access on-campus should be included in m-learning initiative.	Providing a blended learning environment while students have free Internet access on-campus should be included in m-learning initiative.
In a flexible learning environment, each student learns to use the social media application on their mobile devices at any time or any place to suit their learning needs. (CH 3: DDP 2, 3, 8 & 14; CH 4: DDP 5; CH5: DDP 2)	Being flexible about the completion of the communicated tasks is important to enhance continued participation in a m-learning intervention.	Being flexible in the improvement of the m-learning intervention does not only afford an improved experience, but group cohesion was also enhanced with the early communication of tasks and subsequent more time to complete them.	Being flexible in the improvement of the m-learning intervention does not only afford an improved experience, but group cohesion was also enhanced with the early communication of tasks and subsequent more time to complete them.
A combination of face-to-face and online learning experiences, blended learning, creates an interactive learning platform. (CH 3: DDP 15)	WhatsApp Messenger, a m-learning platform for engagement, can be utilised for discussions and responses in real-time to enhance learning.	WhatsApp Messenger, a m-learning platform for engagement, can be utilised for discussion and responses	

		in real-time to enhance learning.	
Preparation of all students and lecturers and clinical facilitators for an authentic WhatsApp Messenger ensures the success of a m-learning intervention. (CH 3: DDP 5 & 3; CH 4: DDP 4; CH 5: DDP 2)	Sufficient training and instruction should precede online tasks, communicated during a m-learning intervention and focused on the need and practicality of the learning task.		
Cultivate a positive attitude towards the use of personal mobile devices for a m-learning intervention. (CH 4: DDP 7 & 8)	Different multimodal possibilities, for example video or digital recordings, should be offered to students to represent their learning using mobile devices.		
Social interaction among students includes the MKO and the ZPD (two main principles underlying the Vygotskian Framework) and supports cognitive development. (CH 3: DDP 10)	The WMGs enhanced peer support by creating a collaborative online working environment.	WhatsApp Messenger creates a collaborative online working environment and support system that improves group cohesion.	WhatsApp Messenger creates a collaborative online working environment and support system that improves group cohesion.
Interactive and collaborative learning opportunities are extended by students consulting peers (as the MKO) as a resource on a WMG after hours. (CH 3:		WhatsApp Messenger affords group work and peer support improving group cohesion providing a platform to share	

DDP 7; CH 5: DDP 19 & 21)		knowledge.	
The LMS of the HEI, offered on the Sakai platform, iKamva, could be actively used to engage in discussions and share documents. (CH 5: DDP 23)			
Students should summarise and present an actual case (with real-life images) managed in clinical facilities, and an example of how to formulate a case study should be provided. (CH 5: DDP 25 & 26)	M-learning activities using WhatsApp Messenger could be used to promote students' self-study through researching communicated activities and discussing them with students and with lecturers and clinical facilitators.		
Learning using mobile devices, focused on certain common conditions within in the clinical facility, is implemented on both prepared cases or case studies and an actual case. (CH 5: DDP 18, 25 & 26)	Learning tasks that incorporate the functions available on mobile devices, e.g. creating videos, can be used to reflect the integration of theory and practical skills acquired while in clinical practice.		
Resources are available during a m-learning intervention to combat challenges to access library search engines off-			

<p>campus. (CH 4: DDP 6; CH 5: DDP 15 & 22)</p>			
<p>WMGs are established for every clinical facility to enhance interactive and collaborative communication and to ensure that all students have access to the same amount of information. (CH 3: DDP 6; CH 5: DDP 9, 10 & 17)</p>			
<p>Mobile devices are used as a resource to create an open-door policy between lecturers and clinical facilitators and their students. (CH 5: DDP 22)</p>			
<p>As part of their workload, professional nurses in clinical facilities should accommodate students and provide guidance on clinical skills. (CH 5: DDP 15)</p>	<p>As part of their workload, even when busy, professional nurses in clinical facilities should accommodate students and provide guidance on clinical skills.</p>	<p>As part of their workload, even when busy, professional nurses in clinical facilities should accommodate students and provide guidance on clinical skills.</p>	<p>As part of their workload, even when busy, professional nurses in clinical facilities should accommodate students and provide guidance on clinical skills.</p>
<p>Provide opportunities for visualisation and interaction with learning content by using personal mobile devices e.g. WhatsApp Messenger. (BYOD) (CH 3: DDP 4 & 12;</p>	<p>Timeous submission of group tasks or assessments should be viewed as an important component of the m-learning initiative, with the understanding that</p>	<p>Timely communication of the task to be completed over a two-day period while in clinical placement communication of</p>	<p>Timeous submission of group tasks or assessments should be viewed as an important component of the m-learning initiative, with the understanding that</p>

CH 5: DDP 3 & 4)	students may experience poor network access and that submissions might be delayed.	tasks in one message allowed time for organisation and completion of tasks.	students may experience poor network access and that submissions might be delayed.
WhatsApp Messenger, a mobile messaging application, should be used in a m-learning intervention as it allows for immediate responses in real-time. (CH 4: DDP 11 & 12; CH 5: DDP 5, 6 & 7)			
The use of a smartphone, with its technological advances, is a mode of communication to enhance ITCP. (CH 3: DDP 1; CH 4: DDP 1, 10 & 14; CH 5: DDP 1 & 2)	The consequences of plagiarism should be highlighted in an online m-learning intervention.		
It has value to BYOD in order to participate in a m-learning research study (inclusion criteria). (CH 5: DDP 8).			
Technical support should be in place during a m-learning intervention, even if participants know how to use their mobile devices effectively. (CH 4: DDP 1, 2 & 3)	Technical support should be offered to participants in m-learning interventions	Technical support should be offered to participants in m-learning interventions	

<p>Mobile technology offers cheaper and effective communication and post-Web 2.0 pedagogical affordances for teaching and learning that enable engagement with students through Internet connectivity, mobility, geolocation and social networks. (CH 3: DDP 11; CH 4: DDP 9 & 13; CH 5: DDP 11 & 12)</p>	<p>Good network coverage and access to free Wi-Fi are important components of a successful m-learning initiative.</p>	<p>Good network coverage and access to free Wi-Fi are important components of a successful m-learning initiative.</p>	<p>Good network coverage and access to free Wi-Fi are important components of a successful m-learning initiative.</p>
<p>The best time for a m-learning intervention is at any available time as guided by students and lecturers and clinical facilitators. (CH 4: DDP 5; CH 5: DDP 16 & 20)</p>	<p>Learning activities should be scheduled at a time suitable to both the students and the clinical facility to minimise challenges with participation as producing videos can be time consuming.</p>	<p>Learning activities should be scheduled at a time suitable to both the students and the clinical facility to minimise challenges with participation as producing videos can be time consuming.</p>	<p>Learning activities should be scheduled at a time suitable to both the students and the clinical facility to minimise challenges with participation as producing videos can be time consuming.</p>
<p>Upholding professionalism during a m-learning intervention includes professional and ethically correct conduct; respecting boundaries regarding cell phone policies of clinical facilities and obtaining permission for a m-learning intervention. (CH 5: DDP 13, 14, 15, 16, 21 & 24)</p>	<p>All facility nursing personnel involved in student learning should be included in a workshop in which ground rules regarding the use of mobile devices in clinical facilities supported by facility policies on cell phone usage, are discussed.</p>	<p>All facility nursing personnel involved in student learning should be included in a workshop in which ground rules regarding the use of mobile devices in clinical facilities supported by facility policies on cell phone usage,</p>	<p>All facility nursing personnel involved in student learning should be included in a workshop in which ground rules regarding the use of mobile devices in clinical facilities supported by facility policies on cell phone usage, are discussed.</p>

		are discussed.	
	In health facilities, adherences to facility policies on cell phone usage while working with patients are important.	In health facilities, adherences to facility policies on cell phone usage while working with patients are important.	In health facilities, adherences to facility policies on cell phone usage while working with patients are important.

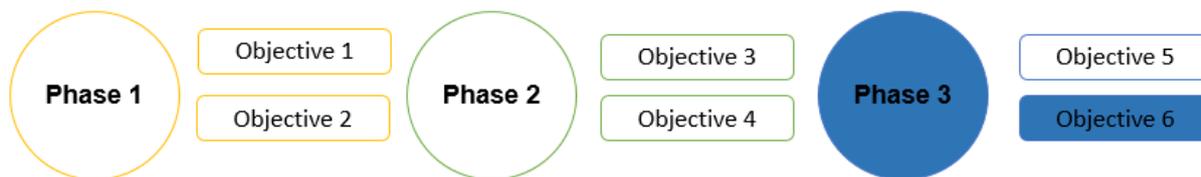


8.7 SUMMARY

Chapter 9 includes a summary of the research process that involved the development of the enactment plan (intervention). The three phases of the Integrative Learning Design Framework (ILDF) of Dabbagh and Bannan-Ritland (2005) (exploration, enactment and evaluation) guided the process of developing the enactment plan (intervention) for integrating the theory and clinical practice of the ENT health assessment in the PCCSM through m-learning. In this research study, an online communication intervention using WhatsApp Messenger (tool) was developed and implemented to enhance ITCP of the ENT health assessment. Through the enactment (intervention), the draft design principles were refined into design principles to be recommended to lectures to guide future m-learning interventions. Chapter 9 includes an overview of the study, conclusions drawn, recommendation for nursing education, nursing practice and research, and the limitations of the study.



9 CHAPTER: CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS



“Be faithful in small things because it is in them that your strength lies.”

Mother Teresa

9.1 INTRODUCTION

This chapter addresses Phase 3 (Objective 6), which is:

to describe recommendations for lecturers and clinical facilitators on how to integrate the theory and clinical practice (ITCP) of the ENT health assessment in the primary care and clinical skills module (PCCSM) through m-learning.

This chapter includes a summary of the research process that involved the development of enactment plan (intervention). The three phases, exploration, enactment and evaluation phases, of the Integrative Learning Design Framework (ILDF) of Dabbagh and Bannan-Ritland (2005) guided the process of developing the enactment plan and intervention to integrate the theory and clinical practice of the ENT health assessment in the PCCSM through m-learning. An online enactment (intervention) using WhatsApp Messenger as a tool to communicate activities, was implemented to enhance ITCP of the ENT health assessment.

The findings of the study are discussed under the following headings:

- Overview of the study
- Conclusions
- Recommendation for nursing education, nursing practice and research
- Limitations of the study
- Recommendations for further research

9.2 OVERVIEW OF THE STUDY

The systematic but flexible methodology, ILDF of Dabbagh and Bannan-Ritland (2005), guided the changes made to the three iterative cycles in the enactment (intervention). The changes were also informed by the collaboration between the researcher (actor), students and lecturers and clinical facilitators (community) in real-world settings that led to the refinement of design principles (outcome) (Wang & Hannafin, 2005). The objectives of the three phases (exploration, enactment and evaluation) of the ILDF of Dabbagh and Bannan-Ritland (2005) were to attain the aim and guide the systematic development of a refined plan for a future intervention (Figure 9.1).

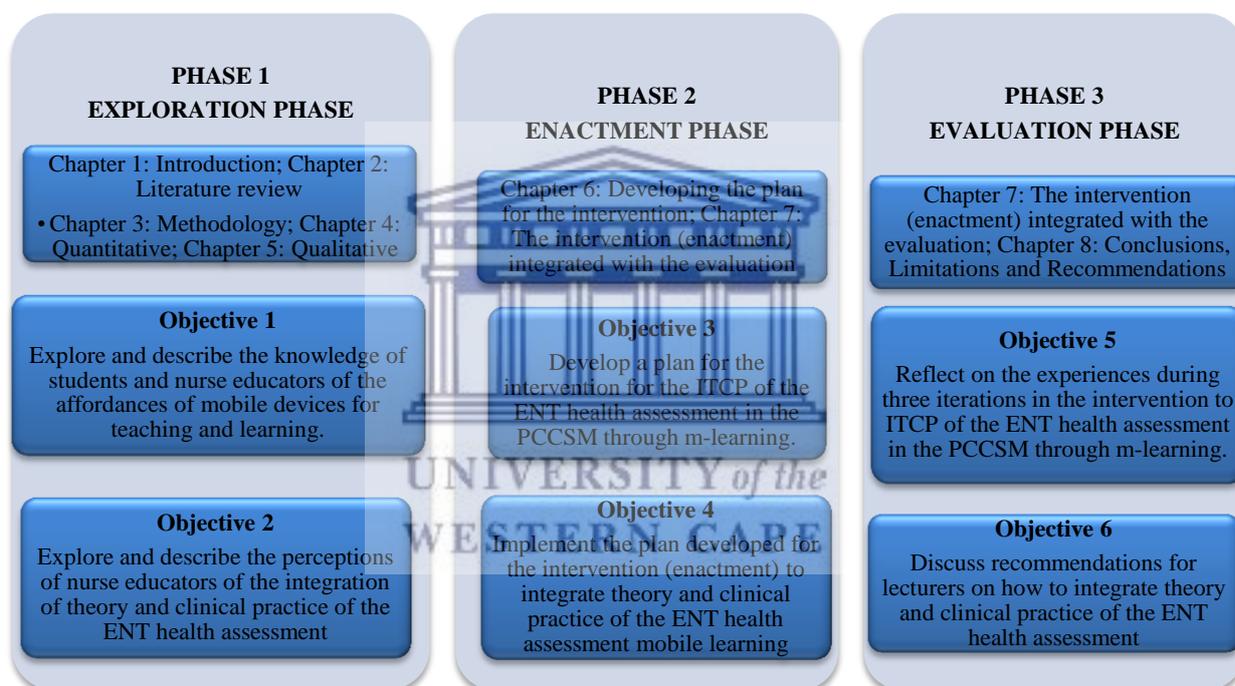


Figure 9.1: Overview of the research phases, aim, objectives and chapters

The elements of quantitative and qualitative research approaches afforded the ability to ascertain the extent and complexity of understanding and validating the integration of mobile devices in undergraduate nursing, thereby enhancing teaching and learning (Plano Clark & Creswell, 2010). During Phase 1 of this research study, students and lecturers and clinical facilitators participated in and contributed to the development of an enactment plan (intervention). Consequently, recommendations for lecturers on how to integrate theory and clinical practice of

the ENT health assessment in the PCCSM (even though they were not specialist in instructional design) could be produced (Dabbagh & Bannan-Ritland, 2005).

The need to include training in information and communication technology into educational practice at HEIs to ensure the necessary competency of educators in instructional design was identified (Tondeur, Aesaert, van Braak, Pynoo, Freyman, & Erstadt, 2017). This need was addressed in this research study in which the relationship between the pedagogical beliefs of educators and their application of digital technologies to support 21st century teaching and learning initiatives was explored (Ertmer, Anne & Tondeur, 2015). Pacansky-Brock (2017) observed the changes in the teaching and learning landscape in higher education with the increased need to move from presenting passive, teacher-centred experiences to designing active, student-centred learning experiences. With the low cost of emerging technologies, such as the WhatsApp Messenger application on mobile devices in this study, the use of post-Web 2.0 tools and experimentation and discovery in teaching and learning have increased (Pacansky-Brock, 2017).

The literature review (Chapter 2), quantitative survey (Chapter 4) and qualitative exploration (Chapter 5) informed the development of draft design principles (plan) for the planned online WhatsApp Messenger communication intervention. Data collected after the first iteration was used to refine the second and subsequent third iteration (Chapter 7). The draft design principles were thus refined throughout the three iterations and design principles to be recommended for a final m-learning intervention (Objective 6). The draft design principles thus provided a foundation for the development of the intervention plan for the intervention to enhance the ITCP of the ENT health assessment. This study produced 24 refined design principles (Table 9.1), recommended for use by lecturers and clinical facilitators, for integrating theory and clinical practice of the ENT health assessment using WhatsApp Messenger.

9.3 CONCLUSIONS FROM THE FINDINGS

The advancements in mobile technology offer post-Web 2.0 pedagogical affordances for teaching and learning that enables engagement with students. The role of social interaction has to be acknowledged in the cognitive development of the student, supported by an appropriate learning theory, e.g. situated learning. Preparation of all students and lecturers and clinical facilitators for an authentic WhatsApp Messenger ensures the success of a m-learning

intervention. The m-learning platform created, WhatsApp Messenger, proved effective in providing a platform for the engagement of students and lecturers and clinical facilitators, with students acting as each other's more knowledgeable peers. WhatsApp Messenger was identified by students and lecturers and clinical facilitators as the best method of online communication, enhancing ITCP of the ENT health assessment due to affordances offered, which include: *affordability, link-ability, share-ability, write-ability, readability, view-ability, video-production-ability, speak-ability, listen-ability and move-ability*. WhatsApp Messenger afforded real-time communication. Lecturers and clinical facilitators were able to respond to activities submitted by students immediately in real-time, which afforded a great learning platform.

The WMGs created proved to be effective as students indicated that learning in a group context made learning easier. The groups have to set norms and values for their group interaction as some groups identified that some individuals were initially not contributing. Challenges with Internet connectivity and the availability of data bundles impacted accessibility to online learning tasks communicated to students using WhatsApp Messenger. Ensuring network coverage and free Wi-Fi is of importance for a successful m-learning intervention. Even though the production of videos to illustrate their examination techniques of the ENT health assessment was viewed as time consuming, students did acknowledge that it was a positive learning experience. Technical difficulties were experienced with some functions of personal mobile devices during the enactment (intervention). Personnel at some of the facilities were extremely busy, which impacted their ability to provide guidance to students on the communicated activities. It was deemed as unprofessional to use mobile devices in clinical facilities to enhance ITCP. At some clinical facilities students were prohibited from using mobile devices in the clinical facility. Permission was obtained from the Department of Health to conduct the research at two clinical facilities in the WCP.

9.4 RECOMMENDATIONS FOR FUTURE RESEARCH

9.4.1 Recommendations for teaching and learning

The design-based principles identified in this research study could be implemented in other modules and used as departure for future m-learning enactments (interventions). All staff should attend training in mobile teaching, as a blended learning approach has proved to enhance students' online learning experiences. Although this intervention was applied on 3rd year level,

the introduction of m-learning initiatives could start in the 1st year of study. It is important that lecturers and clinical facilitators make the mind shift to move into an authentic, blended and flexible learning environment to ensure that students remain attentive when extending their learning, whether on-campus or in clinical practice. The use and implementation of an enactment (intervention) using mobile technology should be on the agenda of meetings of an undergraduate nursing programme. The refined design-based principles identified in this study could be incorporated in the study guide of the ear nose and throat of the health assessment at other HEIs. The enactment (intervention), as outlined in Chapter 7, with the final Table 9.1, should be presented during a staff development programme. The teaching and learning policy of a university should incorporate a larger focus on mobile technology with the availability and affordability of mobile devices and its popularity with undergraduate students. The research concluded with 23 final design principles (Table 9.1), also to be called the “*Two Dozen Mobile Design Principles*” of a school of nursing, as departure for the focus on m-learning.

Table 9.1: Design principles recommended for a m-learning intervention

FINAL REFINED DESIGN PRINCIPLES
Learning tasks should be designed to promote group participation and encourage dialogic and collaborative student learning.
Establishing the rules of engagement, including group norms and values, could increase a sense of responsibility to complete tasks together at an agreed-upon time.
WhatsApp Messenger, the m-learning platform for engagement, can be used to review and assess prior knowledge.
Providing a blended learning environment while students have free Internet access on-campus should be included in m-learning initiative.
Flexibility in improvement of the m-learning intervention does not only afford an improved experience, but group cohesion was also enhanced with the early communication of tasks and subsequent more time to complete them.
Being flexible about the submission time reduces pressure on students as it allows for the completion and submission of communicated tasks when possible.
Flexibility of tasks communicated to enhance ITCP should be considered during a m-learning intervention.
The online developer must ensure that activities are innovative and exciting to ensure student participation.
WhatsApp Messenger is an innovative educational platform used to motivate students and encourage their participation in learning course content, thereby achieving course outcomes.

Sufficient training and instruction focusing on the need and practicality of the learning task should precede online tasks communicated during a m-learning intervention.
Various multimodal possibilities, for example video or digital recordings, should be offered to students to represent their learning using mobile devices.
The use of the WhatsApp Messenger application on mobile devices facilitated involvement, revision and practice in preparation for assessments.
WhatsApp Messenger creates a collaborative online working environment and support system that improves group cohesion.
M-learning activities using WhatsApp Messenger could be used to promote self-study through research on activities communicated and clarifying discussions among students and with lecturers and clinical facilitators.
WhatsApp Messenger could be used to take and share pictures, illustrating examination skills, which proved to be less time consuming than creating videos.
Timely communication of the task to be completed over a two-day period while in clinical placement and the communication of tasks in one message allowed sufficient time for the organisation and completion of tasks.
When developing a m-learning intervention, the value of the educational instruction needs to be considered before changes are made.
Technical difficulties may be experienced during a new m-learning intervention; thus, the importance of technical support is emphasised.
WhatsApp Messenger, a m-learning platform for engagement, can be utilised for real-time discussions and responses to enhance learning.
Good network coverage and access to free Wi-Fi are important considerations for successful m-learning initiatives.
Learning activities should be scheduled at a time that is suitable to both the student and the clinical facility to minimise challenges with participation.
All new lecturers and clinical facilitators should be orientated on the use of these principles to address the needs of a younger generation.
Preparation of nursing personnel at clinical facilities for a m-learning intervention is important to ensure that students are supported in their pursuit to enhance their learning.
In health facilities, adherence to facility policies on cell phone usage while working with patients is of importance.

9.4.2 Recommendations for research

The ability to access and distribute course-related content to students using the Internet on their mobile devices would be important for lecturers and clinical facilitators. A workshop would be needed to assist with and to reinforce how to use their mobile devices effectively to develop

content in an online learning environment. The benefits of using mobile devices to communicate with and to offer academic support to students could be reinforced in a workshop. More studies can be done on the use of mobile technology to enhance teaching and learning experiences of student nurses, lecturers and clinical facilitators at schools of nursing within a South African context.

9.4.3 Recommendations for practice

Clinical practice facilities should be more open to mobile technology and the policies should accommodate m-learning. The availability of Wi-Fi should be guaranteed to ensure the success of the m-learning enactment (intervention). In-service training on the use of mobile technology should be provided to students and lecturers and clinical facilitators to enhance learning. Staff should be aware that m-learning should be flexible, especially in a multi-disciplinary team environment in which various students of various disciplines need clinical practice. Policies on the use of mobile devices should be revised to ensure that student learning, using m-learning initiatives, is not compromised in clinical practice.

9.5 LIMITATIONS OF THE STUDY

The identified limitations had an effect on the research sample. Participants who were not able to access WhatsApp Messenger on their mobile devices were excluded from the study, as indicated in the inclusion criteria. The excluded students were, however, included in the class session, pre and post the three iterative cycles, during the enactment phase. The question posed in the focus groups was initially hard to interpret however definitions of the concepts defined. A reflection session was facilitated on the perceptions of students who participated in the intervention and an introduction to the next iteration was made. There was a relatively poor submission response of electronic reflections from clinical facilitators at the end of every iteration, but the focus group at the end of the three iterations were well attended by lecturers and clinical facilitators. The review of the iterations shared at the focus group was very informative and added value to this research study. To prevent duplication in themes and sub-themes, quotations from matching electronic reflections and the focus group with lecturers and clinical facilitators was included with the relevant iterations to strengthen the research findings. Another limitation was that the study was implemented at a school of nursing in a faculty of community and health sciences at a university and that the outcome may be different if applied at another university. Due to the

comprehensive nature of the methodology and timelines followed in this study, the development of the plan was conducted by one group of third year students in 2013 and then implemented by a similar group of third year students in 2016 on the same topics.

9.6 CONCLUSION

This study developed recommendations for lecturers and clinical facilitators on how:

to enhance the ITCP of the ENT health assessment in the PCCSM through using and integrating the the affordances of mobile devices (Bower, 2008) within the theoretical frameworks of the ILDF (Dabbagh & Bannan-Ritland, 2005) and the Activity Theory (Engestrom, 2008) used to develop and implement and evaluate an intervention.

Quantitative and qualitative phases were followed and 6 objectives were met. The purpose of this study was fulfilled by meeting the purpose of exploring and describing the affordances of mobile devices that informed the development of a plan/intervention that enhanced the ITCP of the ENT health assessment in the PCCSM in an undergraduate nursing programme at an HEI.



REFERENCES (APA 6th Edition)

- Aamodt, A., & Plaza, E. (1994). Case-Based Reasoning: Foundational Issues, Methodological Variations, and System Approaches. *AI Communications*, 7(1), 39-59.
- Abidin, Z., Mathrani, A., Parsons, D., & Suriadi, S. (2016). Opportunities and challenges of mobile learning for promoting mathematical literacy. Australasian Conference on Information Systems, Adelaide. Retrieved from <https://arxiv.org/abs/1606.02497>
- Adams-Becker, S., Cummins, M., Davis, A., Freeman, A., Hall Giesinger, C., & Ananthanarayanan, V. (2017). NMC horizon report: 2017 higher education edition. Austin, Texas: The New Media Consortium.
- Adenuga, O., Kekwaletswe, R., & Coleman, A., (2015). eHealth integration and interoperability issues: towards a solution through enterprise architecture. *Health Information Science Systems*, 3(1), 1-12.
- Adov, L., Must, O., & Pedaste, M. (2017). Attitudes towards mobile devices in Estonian basic education: Using the framework of the UTAUT model. Paper presented at the *International Conference on Learning and Collaboration Technologies*, 319-329.
- Agbor-Baiyee, W. (2009). Orienting student using a case-based instructional approach: A case study. *Journal of Instructional Psychology*, 36(1), 20-29.
- Aharony, N. (2014). The effect of personal and situational factors on LIS students' and professionals' intentions to use e-books. *Library & Information Science Research*, 36(2), 106-113.
- Alfreds, D. (2015). Mxit numbers you may not know. Retrieved from <https://www.fin24.com/Tech/News/Mxit-numbers-you-may-not-know-20151023>
- Ally, M. (2009). *Mobile learning: Transforming the delivery of education and training*. Vancouver: Athabasca University Press.

- Al Mosawi, A., & Wali, E.A. (2015). Exploring the potential of mobile applications to support learning and engagement in elementary classes. *International Journal of Mobile and Blended Learning*, 7(2), 33–44.
- Alrasheedi, M., & Capretz, L.F. (2015). An empirical study of critical success factors of mobile learning platform from the perspective of instructors. *Procedia-Social and Behavioral Sciences*, 176, 211-219.
- Altameem, T. (2011). Contextual Mobile Learning System for Saudi Arabian Universities. *International Journal of Computer Applications*, 21(4), 21-26.
- Amiel, T., & Reeves, T.C. (2008). Design-based research and educational technology: Rethinking technology and the research agenda. *Journal of Educational Technology & Society*, 11(4), 29.
- Anderson, T., & Elloumi, F. (2004). *Theory and Practice of Online Learning*. Vancouver: Athabasca University Press.
- Anderson, T., & Shattuck, J. (2012). Design-based research: A decade of progress in education research? *Educational Researcher*, 41, 16-25.
- Andrews, D., Nonnecke, B., & Preece, J. (2003). Electronic survey methodology: A case study in reaching hard-to-involve internet users. *International Journal of Human-Computer Interaction*, 16(2), 185-210.
- Artino, A.R., La Rochelle, J.S., Dezee, K.J., & Gehlbach, H. (2014). Developing questionnaires for educational research: AMEE Guide No. 87. *Medical Teacher*, 36(6), 463–474.
- Auerbach, D.I., Staiger, D.O., Muench, U., & Buerhaus, P.I. (2013). The nursing workforce in an era of health care reform. *New England Journal of Medicine*, 368(16), 1470-1472.
- Aungst, T.D. (2013). Medical applications for pharmacists using mobile devices. *Annals of Pharmacotherapy*, 47(7-8), 1088-1095.

- Babbie, E. (2010). *The practice of social research*. (12th ed.). Belmont, CA: Wadsworth Cengage Learning.
- Babcock, P. (2010). Real costs of nominal grade inflation? New evidence from student course evaluations. *Economic Inquiry*, 48, 983–996.
- Baines, E., Blatchford, P., & Chowne, A. (2007). Improving the effectiveness of collaborative group work in primary schools: Effects on science attainment. *British Educational Research Journal*, 33(5), 663-680.
- Bajwa, M. (2014). Emerging 21st century medical technologies. *Pakistan Journal of Medical Sciences*, 30(3), 649.
- Bakker, A., & van Eerde, H.A.A. (2014). An introduction to design-based research with an example from statistics education. In A. Bikner-Ahsbabs, C. Knipping, & N. Presmeg (Eds.), *Doing qualitative research: Methodology and methods in mathematics education*. Berlin: Springer.
- Baldwin, A., Mills, J., Birks, M. & Budden, L. (2014). Role modelling in undergraduate nursing education: an integrative literature review. *Nurse Education Today*, 34(6).
- Bandura, A. (1977). *Social Learning Theory*. New York: General Learning Press.
- Banerjee, A., & Chaudhury, S. (2010). Statistics without tears: Populations and samples. *Industrial Psychiatry Journal*, 19(1), 60-65.
- Barab, S., & Squire, K. (2004). Design-based research: Putting a stake in the ground. *Journal of the Learning Sciences*, 13(1), 1–14.
- Baraz, S., Memarian, R., & Vanaki, Z. (2015). Learning challenges of nursing students in clinical environments: A qualitative study in Iran. *Journal of Education and Health Promotion*, 4, 52.
- Barhoumi, C. (2015). The effectiveness of WhatsApp mobile learning activities guided by activity theory on students' knowledge management. *Contemporary Educational Technology*, 6(3), 221-238.

- Barnwell, P. (2016). Do Smartphones Have a Place in the Classroom? From middle schools to colleges, cellphones' adverse effects on student achievement may outweigh their potential as a learning tool. Retrieved from <https://www.theatlantic.com/education/archive/2016/04/do-smartphones-have-a-place-in-the-classroom/480231/>
- Bates, A.W., & Sangra, A. (2011). *Managing technology in higher education: Strategies for transforming teaching and learning*. San Francisco: John Wiley & Sons.
- Bayrak, F., & Yurdugül, H. (2013). University students' computer literacy readiness level in Turkey. *Procedia-Social and Behavioral Sciences*, 106, 3210-3215.
- Begna, M. (2016). The Era of Technological Advancement. Retrieved from <https://www.theodysseyonline.com/the-era-of-technological-advancement>
- Behrend, M.B. (2014). Engeström's activity theory as a tool to analyse online resources embedding academic literacies. *Journal of Academic Language & Learning*, 8(1), A109-A120.
- Belkin, G.S., & Gray, J.L. (1977). *Educational Psychology: An Introduction*. Dubuque Iowa: C Brown Publishers.
- Benga, M. (2016). The Era of Technological Advancement. *Why your current devices will be vastly outdated in the years to come*. Retrieved from <https://www.theodysseyonline.com/the-era-of-technological-advancement>
- Bennett, S., Maton, K., & Kervin, L. (2008). The "digital natives" debate: A critical review of the evidence. *British Journal of Educational Technology*, 39(5), 775–786.
- Bere, A., (2012). A comparative study of student experiences of ubiquitous learning via mobile devices and learner management systems at a South African University, in P. A. Van Brakel (Ed.). *14th Annual conference on World Wide Web application*. Cape Town.
- Berry, N., Lobban, F., Emsley, R., & Bucci, S. (2016). Acceptability of interventions delivered online and through mobile phones for people who experience severe mental

- health problems: A systematic review. *Journal of Medical Internet Research*, 18(5), e121. doi: 10.2196/jmir.5250
- Blackwell's nursing dictionary* (2005). In Freshwater D., Maslin-Prothero S. (Eds.). (2nd ed.). Oxford: Blackwell.
- Blatchford, P., Kutnick, P., Baines, E., & Galton, M. (2003). Towards a social pedagogy of classroom group work. *International Journal of Educational Research*, 39(1-2), 153 - 172. DOI: 10.1016/S0883-0355(03)00078-8
- Bosch, T.E. (2009). Using online social networking for teaching and learning: Facebook use at the University of Cape Town. *South African Journal for Communication Theory and Research*, 35(2), 185-200.
- Botma, Y., Greef, M., Mulaudzi, F.N., & Wright, S.C. (2010). *Research in health sciences*. Cape Town, South Africa: Pearson Education.
- Bouhnik, D., & Deshen, M. (2014). WhatsApp goes to school: Mobile instant messaging between teachers and students. *Journal of Information Technology Education: Research*, 13, 217-231.
- Bower, M. (2008). Affordance analysis - matching learning tasks with learning technologies. *Educational Media International*, 45(1), 3e15. doi.org/10.1080/09523980701847115
- Bower, M. (2017). *Design of Technology-Enhanced Learning: Integrating Research and Practice*. Yorkshire, England: Emerald Publishing Limited.
- Bower, M., & Sturman, D. (2015). What are the educational affordances of wearable technologies? *Computers & Education*, 88, 343-353.
- Bozalek, V., Ng'ambi, D., Wood, D., Herrington, J., Hardman, J., & Amory, A. (2014). *Activity theory, authentic learning and emerging technologies: Towards a transformative higher education pedagogy*. New York, NY: Routledge.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77-101.

- Braungart, M., Braungart, R., & Gramet, P. (2014). Applying learning theories to healthcare practice. In: S. Bastable (Ed.), *Nurse as educator principles of teaching and learning for nursing practice* (4th ed., pp 63–110). Burlington, MA: Jones and Bartlett.
- Breitmayer, B.J., Ayres, L., & Knafl, K.A. (1993). Triangulation in qualitative research: Evaluation of completeness and confirmation purposes. *Journal of Nursing Scholarship*, 25(3), 237-243.
- Brink, H.I., van der Walt, C., & van Rensburg, G. (2017). *Fundamentals of research methodology for health care professionals* (4th ed.). Cape Town: Juta Legal and Academic Publishers.
- Brooks-Young, S. (2010), *Teaching with the Tools Kids Really Use: Learning with Web and Mobile Technologie*. Thousand Oaks, CA: Corwin.
- Brown, C., & Czerniewicz, L. (2007). If we build it will they come? Investigating the relationship between students' access to and use of ICTs for learning. *South African Journal of Higher Education*, 21(6), 730-745.
- Brown, J.S., Collins, A., & Duguid, P. (1989). Situated cognition and the culture of learning. *Educational Researcher*, 18(1), 32-42.
- Brown, M.G. (2016). Blended instructional practice: A review of the empirical literature on instructors' adoption and use of online tools in face-to-face teaching. *Internet and Higher Education*, 31, 1-10.
- Brown, Q. (2009). Mobile intelligent tutoring system: Moving intelligent tutoring systems off the desktop (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses database. UMI No. AAT 3374733
- Bryman, A. (2016). *Social research methods* (5th ed., pp. 16-39). United Kingdom: Oxford University Press.
- Bulger, M.E., Mayer, R.E., & Metzger, M.J. (2014). Knowledge and processes that predict proficiency in digital literacy. *Reading and Writing*, 27(9), 1567-1583.

- Burns, N., & Grove, S. (2009). *The practice of nursing research: Appraisal, synthesis and generation of evidence* (6th ed.). St. Louis: Saunders Elsevier.
- Burns, N., & Grove, S.K. (2017). *The practice of nursing research: Appraisal, Synthesis, And Generation of Research Evidence*. (8th ed.). St. Louis, MO: Elsevier.
- Butgereit, L. (2007). Math on MXit: Using MXit as a medium for mathematics education. *Meraka INNOVATE Conference for Educators*, CSIR, Pretoria, 18-20 April 2007.
- Calvo, R., Arbiol, A., & Iglesias, A. (2014). Are all chats suitable for learning purposes? A study of the required characteristics. *Procedia Computer Science*, 27, 251-260.
- Caruso, H.M., & Woolley, A.W. (2008). Harnessing the power of emergent interdependence to promote diverse team collaboration. In K.W. Phillips, E. Mannix, & M.A. Neale (Eds.), *Research on managing groups and teams: Diversity and groups* (pp. 245-266). Bingley, UK: Emerald Group Publishing Limited.
- Castells, M. (2012). *Networks of Outrage and Hope: Social Movements in the Internet Age*. Cambridge: Polity Press.
- Castleberry, A., Franks, A., & Nolen, A. (2017). *Reading between the lines: Using qualitative constant comparison to examine professional reflection in the medical field*. Sage Research Methods Cases. doi:10.4135/9781473989276
- Cetinkaya, L. (2017). The Impact of Whatsapp Use on Success in Education Process. *The International Review of Research in Open and Distributed Learning*, 18(7), 59-74.
- Charmaz, K. (2006). *Constructing grounded theory: A practical guide through qualitative analysis*. London: SAGE Publications.
- Charm, Y. C., & Wishart, J. (2015). Use of mobile learning during clinical practicum in Hong Kong: Nursing students' perspective. In *Proceedings of the International Mobile Learning Festival 2015: Mobile Learning, MOOCs and 21st Century learning* (pp. 172-185). Hong Kong.
- Cheung, C.M.K., Chiu, P., Matthew K.O., & Lee, M. (2011). Online social networks: Why do students use facebook? *Computers in Human Behavior*, 27, 1337-1343.

- Chickering, A.W., & Gamson, Z.F. (1987). Seven principles for good practice in undergraduate education. *American Association of Higher Education Bulletin*, 39(7), 3 – 7.
- Church, K., & de Oliveira, R. (2013). What's up with Whatsapp?: Comparing mobile instant messaging behaviors with traditional SMS. Paper presented at the *Proceedings of the 15th International Conference on Human-Computer Interaction with Mobile Devices and Services*, 352-361.
- Clark, J.L., & Swanepoel, D. (2014). Technology for hearing loss – as We Know it, and as We Dream it. *Disability and Rehabilitation: Assistive Technology*, 9(5), 408-413.
- Clark, W., & Luckin, R. (2013). *What research says – iPads in the classroom*. London: Knowledge Lab, Institute of Education University of London.
- Clayton, K.E., & Murphy, A. (2016). Smartphone Apps in Education: Students Create Videos to Teach Smartphone Use as Tool for Learning. *Journal of Media Literacy Education*, 8(2), 99 -109.
- Cochrane, T.D. (2014). Critical success factors for transforming pedagogy with mobile web 2.0. *British Journal of Educational Technology*, 45(1), 65-82.
- Cochrane, T., Antonczak, L., Keegan, H., & Narayan, V. (2014). Riding the wave of BYOD: Developing a framework for creative pedagogies. *Research in Learning Technology*, 22(1), 24637.
- Cochrane, T. & Bateman, R. (2010). Smartphones give you wings: Pedagogical affordances of mobile Web 2.0. *Australasian Journal of Educational Technology*, 26(1), 1-14.
- Cochrane, T., Sissons, H., Mulrennan, D. & Pamatatau, R. (2016). Journalism 2.0: Exploring the impact of mobile and social media on journalism education. *International Journal of Mobile and Blended Learning*, 5(2), 22-38.
- Cognition and Technology Group at Vanderbilt. (1996). Looking at technology in context: A framework for understanding technology and education research. In D. C. Berliner,

- & R. C. Calfee (Eds.), *The handbook of educational psychology*, (pp. 807-840). New York: Simon & Schuster MacMillan.
- Collins, A., Brown, J.S., & Newman, S.E. (1989). Cognitive apprenticeship: Teaching the crafts of reading, writing, and mathematics. In L. B. Resnick (Ed.), *Knowing, Learning and Instruction: Essays in Honor of Robert Glaser*, (pp. 453- 494). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Collis, B. (1997). Pedagogical reengineering: A pedagogical approach to course enrichment and redesign with the WWW. *Educational Technology Review*, 8, 11-15, *Exploring Technology-Mediated Learning... (PDF Download Available)*. Retrieved from https://www.researchgate.net/publication/49278488_Exploring_Technology-Mediated_Learning_from_a_Pedagogical_Perspective
- Collins, K.M.T. in Tashakkori, A., & Teddlie, C. (Eds.). (2010). *SAGE Handbook of Mixed Methods in Social & Behavioral Research* (2nd ed.). Thousand Oaks, CA: SAGE Publishing.
- Conejar, R.J., & Kim, H.K. (2014). The effect of the future mobile learning: Current state and future opportunities. *International Journal of Software Engineering and its Applications*, 8(8), 193-200.
- Conole, G., & Dyke, M. (2004). What are the affordances of information and communication technologies? *Research in Learning Technology*, 12(2), 113-124.
- Conole, G., Dyke, M., Oliver, M., & Seale, J. (2004). Mapping pedagogy and tools for effective learning design. *Computers and Education*, 43(1-2), 17-33.
- Cook, J. (2010). Mobile Phones as Mediating tools within Augmented contexts for development. *International Journal of Mobile and Blended Learning*, 2(3), 1-12.
- Cook, J., Pachler, N., & Bradley, C. (2008). Bridging the gap? Mobile phones at the interface between informal and formal learning. *Journal of the Research Center for Educational Technology*, 4(1), 3-18.

- Creswell, J.W. (2015). *Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research* (5th ed.). Boston: Pearson.
- Creswell, J.W. (2013). *Research design: Qualitative, quantitative, and mixed methods approaches*. Los Angeles, CA: SAGE Publications.
- Creswell, J.W. (2014). *A concise introduction to mixed methods research*. Los Angeles, California: SAGE Publications.
- Creswell, J.W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). Los Angeles, California: SAGE Publications.
- Creswell, J.W., Klassen, A.C., Plano Clark, V.L., & Smith, K.C. (2011). For the office of behavioral and social sciences research. *Best Practices for Mixed Methods Research in the Health Sciences*, 1-37.
- Creswell, J.W., & Plano Clark, V.L. (2010). *Designing and conducting mixed methods research* (2nd ed.). Thousand Oaks, CA: SAGE Publications.
- Crompton, H. (2013). A historical overview of mobile learning: Toward learner-centered education. *Handbook of Mobile Learning*, 3-14.
- Crompton, H., & Burke, D. (2018). The use of mobile learning in higher education: A systematic review. *Computers & Education*, 123, 53-64.
- Crossman, A. (2017). Deductive vs Inductive Reasoning - What's the difference? An overview of two different approaches to scientific research. Retrieved from <https://www.Thoughtco.Com/Deductive-Vs-Inductive-Reasoning-3026549>
- Croxon, L., & Maginnis, C. (2009). Evaluation of clinical teaching models for nursing practice. *Nurse Education in Practice*, 9(4), 236-243.
- Dabbagh, N., & Bannan-Ritland, B. (2005). *Online learning: Concepts, strategies, and applications*. Upper Saddle River: Pearson Education.
- Dahlstrom, E., Brooks, D.C., Grajek, S., & Reeves, J. (2015). *ECAR Study of Students and Information Technology*. Research report. Louisville, CO: ECAR, December 2015.

- Dahlstrom, M.F. (2014). Using narratives and storytelling to communicate science with nonexpert audiences. *Proceedings of the National Academy of Sciences of the United States of America*, 111(4), 13614-13620.
- Daly, M., & Burn, E. (2017). Clinical learning using a case review/clinical mentorship model. *The Journal for Nurse Practitioners*, 13(7), e327. <https://doi.org/10.1016/j.nurpra.2017.05.026>
- Danesh, A., Bailey, A., & Whisenand, T. (2015). Technology and instructor-interface interaction in distance education. *International Journal of Business and Social Science*, 6(2), 39-47.
- Daniels, F.M. (2010). Response to National Policy imperatives for Nursing Education: A Western Cape Case Study. *Curationis*, 33(1), 41 - 48.
- Daniels, F.M., Fakude, L.P., Linda, N.S., & Modeste, R.R.M. (2015). Nurse educators' experiences of case-based education in a South African nursing programme. *Curationis*, 38(2), 1-8.
- Daniels, F.M., & Khanyile, T. D. (2013). A framework for effective collaboration: A case study of collaboration in nursing education in the Western Cape, South Africa. *Nurse Education Today*, 33(9), 956-961.
- De Corte, E. (2010). Historical developments in the understanding of learning. In H. Dumont, D. Istance, & F. Benavides (Eds.), *The Nature of Learning: Using Research to Inspire Practice*, OECD Publishing. Retrieved from [doi:http://dx.doi.org/10.1787/9789264086487-en](http://dx.doi.org/10.1787/9789264086487-en)
- Delpont, C.S.L., & Fouché, C.B. (2011). Mixed methods research. In A.S. De Vos, H. Strydom, C.B. Fouché, & C.S.L. Delpont (Eds.), *Research at the grass roots for the social sciences and human service professions* (4th ed.). Pretoria: JL Van Schaik Publishers.
- Demouy, V., & Kukulska- Hulme, A. (2010). On the spot: using mobile devices for listening and speaking practice on a French language programme. *The Journal of Open, Distance and e-Learning*, 25(3), 217-232.

- Deniz, M. H., & Geyik, S. K. (2015). An empirical research on general internet usage patterns of undergraduate students. *Procedia-Social and Behavioral Sciences*, 195, 895-904.
- De Vos, A.S., Strydom, H., Fouché C.B. & Delpont C.S.L. (2011). *Research at the grass roots for the social sciences and human service professions* (4th ed.). Pretoria: JL Van Schaik Publishers.
- Dewah, P., & Mutula, S. (2013). Mobile phone access and use among students at the National University of Technology, Bulawayo, Zimbabwe: Implications for academic integrity. *Innovation: Journal of Appropriate Librarianship and Information Work in Southern Africa*, 2013(46), 150-165.
- Dewey, J. (1998). *Experience and education*. West Lafayette, Indiana: Kappa Delta Pi. (Original work published 1938).
- de Witt, C., & Gloerfeld, C. (2018). Mobile Learning and Higher Education. In: D. Kergel, B. Heidkamp, P. Telléus, T. Rachwal, & S. Nowakowski (Eds.), *The Digital Turn in Higher Education*. Wiesbaden: Springer VS.
- Diliberto-Macaluso, K., & Hughes, A. (2016). The Use of Mobile Apps to Enhance Student Learning in Introduction to Psychology. *Teaching of Psychology*, 43(1), 48-52.
- Dimond, R., Bullock, A., Lovatt, J., & Stacey, M. (2016). Mobile learning devices in the workplace: 'as much a part of the junior doctors' kit as a stethoscope'? *BMC Medical Education*, 16(1), 207.
- Dixon-Krauss, L. (1996). *Vygotsky in the classroom: mediated literacy instruction and assessment*. White Plains, NY: Longman Publishers.
- Dornyei, Z. (2007). *Research methods in applied linguistics*. New York: Oxford University Press.
- D'Souza, M.S., Karkada, S.N., & Castro, R. (2014). Exploring e-learning among nurse educators in undergraduate nursing. *Journal of Nursing Education and Practice*, 4(7), 73-84.

- Dube, S., & Scott, E. (2014). An empirical study on the use of the Sakai Learning Management System (LMS): Case of NUST, Zimbabwe. *Proceedings of the e-Skills for Knowledge Production and Innovation Conference 2014*, Cape Town, South Africa, 101-107. Retrieved from <http://proceedings.e-skillsconference.org/2014/e-skills101-107Dube851.pdf>
- Dunn, S. V., & Hansford, B. (1997). Undergraduate nursing students' perceptions of their clinical learning environment. *Journal of Advanced Nursing*, 25: 1299–1306.
- Edoho, E.A., & Bassey, U.J. (2014). School Based Computer/Internet Training Needs for Primary School Teachers on Skill Acquisition in Akwa Ibom State of Nigeria. *Journal of Education and Practice*, 5(20), 138-142.
- Ellaway, R., Fink, P., Graves, L., & Campbell, A. (2013). Left to their own devices: medical learners' use of mobile technologies. *Medical Teacher*, 36(2), 130–138.
- Engeström, Y. (1987). *Learning by expanding: An activity-theoretical approach to developmental research*. Helsinki: Orienta-Konsultit.
- Engeström, Y. (1999). Innovative learning in work teams: Analyzing cycles of knowledge creation in practice. *Perspectives on Activity Theory*, 377-404.
- Engeström, Y. (2001). Expansive learning at work: Toward an activity theoretical reconceptualization. *Journal of Education and Work*, 14(1), 133-156.
- Engeström, Y. (2008). *From teams to knots: Activity-theoretical studies of collaboration and learning at work*. Cambridge: Cambridge University Press.
- Ertmer, P., Anne, O.L., & Tondeur, J. (2015). *Teacher beliefs and uses of technology to support 21st century teaching and learning*. International handbook of research on teachers' beliefs. New York, NY: Routledge.
- Essays, U.K. (2017). Importance of Internet in Modern Education. Retrieved from <https://www.ukessays.com/essays/management/importance-of-internet-in-modern-education.php?cref=1>

- Fairhurst, K., & Sheikh, A. (2008). Texting appointment reminders to repeated non-attenders in primary care: randomised controlled study. *Quality & Safety in Health Care*, 17, 373–376.
- Falahah, S., & Rosamala, D. (2012). Study of social networking usage in higher education environment. *Social and Behavioural Sciences*, 67, 156-166.
- Farley, H., Murphy, A., Johnson, C., Carter, B., Lane, M., Midgley, W., Hafeez-Baig, A., Dekeyser, S., & Koronios, A. (2015). How do students use their mobile devices to support learning? A case study from an Australian regional university. *Journal of Interactive Media in Education*, 1(14), 1–13.
- Fenn, J., & LeHong, H. (2011). Hype cycle for emerging technologies. Retrieved from <https://www.gartner.com/doc/1754719/hype-cycle-emerging-technologies>
- Fewkes, A.M., & McCabe, M. (2012). Facebook: Learning tool or distraction? *Journal of Digital Learning in Teacher Education*, 28(3), 92-98.
- Firestone, W.A. (1987). Meaning in Method: The Rhetoric of Quantitative and Qualitative Research. *Educational Researcher*, 16(7), 16-21.
- Fisher, M.J., & Marshall, A.P. (2009). Understanding descriptive statistics. *Australian Critical Care*, 22(2), 93 – 97.
- Fox, S., Rainie, L., Larsen, E., Horrigan, J., Lenhart, A., Spooner, T., & Carter, C. (2001). Wired seniors. *Pew Internet & American Life Project*, 14.
- Frohberg, D., Göth, C., & Schwabe, G. (2009). Mobile learning projects – a critical analysis of the state of the art. *Journal of Computer Assisted Learning*, 25(4), 307-331.
- Gachago, D., Strydom, S., Hanekom, P., Simons, S., & Walters, S. (2015). Crossing boundaries: lecturers' perspectives on the use of WhatsApp to support teaching and learning in higher education. *Progressio: South African Journal for Open and Distance Learning Practice*, 37(1), 172 -187.

- Garrison, D. R., & Vaughan, N. D. (2008). *Blended learning in higher education: Framework, principles, and guidelines*. San Francisco, CA: Jossey-Bass Publishing, John Wiley & Sons.
- Gašević, D., Dawson, S., & Siemens, G. (2015). Let's not forget: Learning analytics are about learning. *Tech Trends*, 59(1), 64 - 71.
- Gavali, M.Y., Khismatrao, D.S., Gavali, Y.V., & Patil, K.B. (2017). Smartphone, the New Learning Aid amongst Medical Students. *Journal of Clinical and Diagnostic Research: JCDR*, 11(5), JC05–JC08. DOI: 10.7860/JCDR/2017/20948.9826
- George, L.E., Davidson, L.J., Serapiglia, C.P., Barla, S., & Thotakura, A. (2010). Technology in nursing education: A study of PDA use by students. *Journal of Professional Nursing*, 26(6), 371-376.
- Ghavifekr, S., & Rosdy, W.A.W. (2015). Teaching and learning with technology: Effectiveness of ICT integration in schools. *International Journal of Research in Education and Science*, 1(2), 175-191.
- Gibson, J.J. (1967). *The ecological approach to visual perception*. New York, NY: Taylor & Francis Group.
- Gibson, J.J. (1979). *The Ecological Approach to Visual Perception*. Boston: Houghton Mifflin.
- Gikas, J., & Grant, M.M. (2013). Mobile computing devices in higher education: Student perspectives on learning with cellphones, smartphones & social media. *The Internet and Higher Education*, 19, 18-26.
- Gillies, R.M., & Boyle, M. (2010). Teachers' reflections on cooperative learning: Issues of implementation. *Teaching and Teacher Education*, 26(4), 933-940.
- Giordano, V., Koch, H., Godoy-Santos, A., Belangero, W.D., Pires, R.E.S., & Labronici, P. (2017). WhatsApp messenger as an adjunctive tool for telemedicine: An overview. *Interactive Journal of Medical Research*, 6(2), e11. DOI: 10.2196/ijmr.6214

- Goddard, W., & Melville, S. (2004). *Research methodology: An introduction*. Cape Town, South Africa: Juta and Company Ltd.
- Gon, S., & Rawekar, A. (2017). Effectivity of E-learning through WhatsApp as a teaching learning tool. *MVP Journal of Medical Sciences*, 4(1), 19-25.
- Gordon, N. (2014). Flexible Pedagogies: technology-enhanced learning. Higher Education Academy. Retrieved from https://www.heacademy.ac.uk/sites/default/files/resources/tel_report_0.pdf
- Groves, R.M., Fowler, F.J., Couper, M.P., Lepkowski, J.M., Singer, E., & Tourangeau, R. (2009). *Survey Methodology*. (2nd ed). New York, NY: Wiley.
- Guba, E.G., & Lincoln, Y.S. (1994). Competing paradigms in qualitative research. In N. K. Denzin, & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (pp. 105-117). Thousand Oaks, CA: SAGE Publications.
- Gupta, B., & Koo, Y. (2010). Applications of M-learning in Higher Education: An Empirical Study. *International Journal of Information and Communication Technology Education*, 6(3), 75-87.
- Guy, R., Hocking, J., Wand, H., Stott, S., Ali, H., & Kaldor, J. (2012). How Effective Are Short Message Service Reminders at Increasing Clinic Attendance? A Meta-Analysis and Systematic Review. *Health Services Research*, 47(2), 614–632.
- Hamilton, J., & Tee, S. (2013). Blended teaching and learning: a two-way systems approach. *Higher Education Research & Development*, 32(5), 748-764.
- Hammar Chiriac, E. (2014). Group work as an incentive for learning – students' experiences of group work. *Frontiers in Psychology*, 5, 558.
- Hancock, D.R., & Algozzine, B. (2011). *A practical guide for beginning researchers doing case study research* (2nd ed). New York, NY: Teachers College Press.
- Hardman, J. (2005). Activity theory as a potential framework for technology research in an unequal terrain. *South African Journal of Higher Education*, 19(2), 275-392.

- Harris, P., Nagy, S., & Vardaxis, N. (2014). *Mosby's dictionary of medicine, nursing and health professions*. Australian & New Zealand edition-eBook: Elsevier Health Sciences.
- Hashim, K.F., Tan, F.B., & Rashid, A. (2015). Adult learners' intention to adopt mobile learning: A motivational perspective. *British Journal of Educational Technology*, 46(2), 381-390.
- Hassini, E. (2006). Student-instructor communication: The role of email. *Computers & Education*, 47(1), 29-40.
- Hattie, J.A.C., & Yates, G. (2014). *Visible learning and the science of how we learn*. London, UK: Routledge.
- Haug, S., Schaub, M. P., Venzin, V., Meyer, C., & John, U. (2013). Efficacy of a Text Message-Based Smoking Cessation Intervention for Young People: A Cluster Randomized Controlled Trial. *Journal of Medical Internet Research*, 15(8), e171. Retrieved from <http://doi.org/10.2196/jmir.2636>
- Heale, R., & Twycross, A. (2015). Validity and reliability in quantitative studies. *Evidence-Based Nursing*, 18(3), 66-67.
- Hek, G., Judd, M., & Moule, P. (2002). *Making sense of research: An introduction for health and social care practitioners*. London: Continuum.
- Herbek, S., Eisl, H.A., Hurch, M., Schator, A., Rauchegger, G., Kollmann, A., Philippi, T.H., Dragon, P., & Seitz, E. (2012). The Electronic Health Record in Austria: a strong network between healthcare and patients. *Springer*, 44(3), 155-163.
- Herrington, A., & Herrington, J. (Eds.). (2006). *Authentic learning environments in higher education*. Hershey, PA: Information Science Publishing.
- Herrington, J.A., McKenney, S., Reeves, T.C., & Oliver, R. (2007). Design-based research and doctoral students: Guidelines for preparing a dissertation proposal. In C. Montgomerie, & J. Seale (Eds.), *Proceedings of EdMedia 2007: World Conference on*

- Educational Multimedia, Hypermedia & Telecommunications* (pp. 4089-4097).
Chesapeake, VA: AACE.
- Herrington, J., & Oliver, R. (2000). An instructional design framework for authentic learning environments. *Educational Technology Research and Development*, 48(3), 23-48.
- Herrington, J., Reeves, T.C., & Oliver, R. (2014) Authentic Learning Environments. In: J. Spector, M. Merrill, J. Elen, & M. Bishop (Eds.), *Handbook of Research on Educational Communications and Technology*. New York, NY: Springer.
- Hoar, R. (2014). Generally Educated in the 21st Century. Proceedings of The Western Canadian Conference on Computing Education — WCCCE '14. Retrieved from <http://dx.doi.org/10.1145/2597959.2597964>
- Holt, G. & Morris, A. (1993). Activity Theory and the Analysis of Organizations. *Human Organization*. Spring, 52(1), 97-109.
- Horrigan, J. (2001). *Online communities: Networks that nurture long-distance relationships and local ties*. Pew Internet & American Life Project. Retrieved from <http://www.pewinternet.org/>
- Horsburgh, D. (2003), Evaluation of qualitative research. *Journal of Clinical Nursing*, 12, 307–312.
- Howell, K. E. (2013). *An introduction to the philosophy of methodology* London: SAGE Publications.
- Huang, H. (2002). Toward constructivism for adult learners in online learning environments. *British Journal of Educational Technology*, 33(1), 27-37.
- Huett, J. (2004). Email as an educational feedback Tool: relative advantages and implementation guidelines. *International Journal of Instructional Technology and Distance Learning*, 1(6). Retrieved from: http://www.itdl.org/Journal/Jun_04/index.htm

- Hugg, R., & Wurdinger, S. (2007). A practical and progressive pedagogy for project-based service learning. *International Journal of Teaching & Learning in Higher Education*, 19(2), 191-204.
- Hwang, G., & Tsai, C. (2011). Research trends in mobile and ubiquitous learning: A review of publications in selected journals from 2001 to 2010. *British Journal of Educational Technology*, 42(4), E65-E70. Retrieved from <http://doi.org/10.1111/j.1467-8535.2011.01183.x>
- Idrus, R. M., & Ismail, I. (2010). Role of institutions of higher learning towards a knowledge-based community utilising mobile devices. *Procedia-Social and Behavioral Sciences*, 2(2), 2766-2770.
- Ifenyi-obi, C.C., Olatunji, S.O., & Enyindah, F. (2014). Effect of Blackberry Messenger Usage on the Academic Activities of Agriculture Students in University of Portharcourt. *IOSR Journal of Agriculture and Veterinary Science*, 7(9), 07-11.
- Illeris, K. (2007). *How We Learn: Learning and Non-Learning in School and Beyond*. London: Routledge.
- Illeris, K. (2009). *Contemporary Theories of Learning*. Abingdon, Oxon: Routledge.
- Ironside, P.M., McNelis, A.M., & Ebright, P. (2014). Clinical education in nursing: rethinking learning in practice settings. *Nursing Outlook*, 62(3), 185-191.
- Ismail, I., Johari, S.S.M., & Idrus, R.M. (2010). Technical appliance in E-learning: Student's perception on the usage of online learning. *International Journal of Emerging Technologies in Learning*, 5(2), 31-35.
- ITU releases 2014 ICT figures. (2014). Geneva, Switzerland: International Telecommunication Union. Retrieved from http://www.itu.int/net/pressoffice/press_releases/2014/23.aspx#.WxF-1e6FN0x
- Ivala, E., & Gachago, D. (2012). Social media for enhancing student engagement: The use of Facebook and blogs at a university of technology. *South African Journal of Higher Education*, 26(1), 152-167.

- Jantjies, M., & Joy, M. (2016). Lessons learnt from teachers' perspectives on mobile learning in South Africa with cultural and linguistic constraints. *South African Journal of Education, 36*(3), 1-10. doi: 10.15700/saje. v36n3a1274
- Jenkins, J. (2016). 6 Mobile Learning Benefits: The Mobile Learning Revolution. Retrieved from <https://elearningindustry.com/6-mobile-learning-benefits-mobile-learning-revolution>
- Johnson, D.W., & Johnson, R.T. (2003). *Assessing students in groups: Promoting group responsibility and individual accountability*. Thousand Oaks, CA: Corwin Press.
- Johnson, L., Adams-Becker, S., Cummins, M., Estrada, V., Freeman, A., & Hall, C. (2016). NMC Horizon Report: 2016 Higher Education Edition. Austin, Texas: The New Media Consortium.
- Johnson, L., Adams-Becker, S., Estrada, V., & Freeman, A. (2015). NMC Horizon Report: 2015 Higher Education Edition. Austin, Texas: The New Media Consortium.
- Johnson, R.B. (2014). *Mixed methods research design and analysis with validity: A primer*. Department of Professional Studies, University of South Alabama, USA.
- Johnson, R.B., Christensen, L.B., & Turner, L.A. (2014). *Research methods, design, and analysis*. (12th ed.). Upper Saddle River, New Jersey: Pearson.
- Jones, A.C., Scanlon, E., & Clough, G. (2013). Mobile learning: Two case studies of supporting inquiry learning in informal and semiformal settings. *Computers & Education, 61*, 21–32.
- Jooste, K., & Jasper, M. (2012). A South African perspective: Current position and challenges in health care service management and education in nursing. *Journal of Nursing Management, 20*(1), 56-64.
- Kaliisa, R., & Picard, M. (2017). A Systematic Review on Mobile Learning in Higher Education: The African Perspective. *The Turkish Online Journal of Educational Technology, 16*(1), 1-18.

- Keith, N., & Frese, M. (2008). Effectiveness of Error Management Training: A Meta-Analysis. *Journal of Applied Psychology, 93*(1), 59-69.
- Kenny, R.F., Van Neste-Kenny, J.M., Burton, P.A., Park, C.L., & Qayyum, A. (2012). Using self-efficacy to assess the readiness of nursing educators and students for mobile learning. *The International Review of Research in Open and Distributed Learning, 13*(3), 277-296.
- Kenny, R.F., Van Neste-Kenny, J.M., Park, C.L., Burton, P.A., & Meiers, J. (2009). Mobile learning in nursing practice education: Applying Koole's FRAME model. *International Journal of E-Learning & Distance Education, 23*(3), 75-96.
- Khrisat, A.A., & Mahmoud, S.S. (2013). Integrating mobile phones into the EFL foundation year classroom in King Abdulaziz University/KSA: Effects on achievement in general English and students' attitudes. *English Language Teaching, 6*(8), 162-174.
- Kimble, G. A. (1961). *'Hilgard and Marquis'* conditioning and learning. New York, NY: Appleton-Century-Crof.
- King, H., Miller, C. L., & Bayerl, J. (2017). Building technology competency: An evidence-based approach to improving student technology skills. *Journal of Formative Design in Learning, 1*(1), 45–55
- Kirkup, G., & Kirkwood, A. (2005). Information and communications technologies (ICT) in higher education teaching – a tale of gradualism rather than revolution. *Learning, Media and Technology, 30*(2), 185-199.
- Klasnja, P., & Pratt, W. (2012). Healthcare in the pocket: Mapping the space of mobile-phone health interventions. *Journal of Biomedical Informatics, 45*(1), 184-198.
- Koffka, K. (1935). *Principles of Gestalt Psychology*. London: Lund Humphries.
- Koohestani, H.R., Soltani Arabshahi, S.K., Fata, L., & Ahmadi, F. (2018). The educational effects of mobile learning on students of medical sciences: A systematic review in experimental studies. *Journal of Advances in Medical Education & Professionalism, 6*(2), 58–69.

- Kuhn, T.S. (1970). *The structure of scientific revolutions*. (2nd ed.). Chicago University: The University of Chicago Press.
- Kukulska-Hulme, A. (2005). Mobile Usability and User Experience. In A. Kukulska-Hulme & J. Traxler (Eds.), *Mobile Learning: A handbook for educators and trainers* (pp. 45-56). London: Routledge.
- Kukulska-Hulme, A. (2009). Will mobile learning change language learning? *ReCALL*, 21(2), 157-165.
- Kukulska-Hulme, A. (2012). How should the higher education workforce adapt to advancements in technology for teaching and learning? *Internet and Higher Education*, 15(4), 247-254.
- Kukulska-Hulme, A. (2016). Mobile Assistance in Language Learning: A critical appraisal. In: A. Palalas, & M. Ally (Eds.), *The International Handbook of Mobile-Assisted Language Learning* (pp. 138–160). Beijing: China Central Radio & TV University Press Co., Ltd.
- Kukulska-Hulme, A., Evans, D., & Traxler, J. (2005). Landscape Study on the Use of Mobile and Wireless Technologies for Teaching and Learning in the Post-16 Sector. 19 JISC-funded project report. Retrieved from http://www.jisc.ac.uk/eli_outcomes.html
- Kukulska-Hulme, A., & Traxler, J. (Eds.). (2005). *Mobile learning: a handbook for educators and trainers*. Open and Flexible Learning Series. London, UK: Routledge.
- Kumar, R. (2005). *Research methodology: A step-by-step guide for beginners* (2nd ed.). London: SAGE.
- Lai, C., Yang, J., Chen, F., Ho, C., & Chan, T. (2007). Affordances of mobile technologies for experiential learning: The interplay of technology and pedagogical practices. *Journal of Computer Assisted Learning*, 23(4), 326-337.
- Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge, UK: Cambridge University Press.

- Leavoy, P. (2016). Learn Better, On The Go. *Learning Technology Trends*. Retrieved from <https://www.docebo.com/blog/mobile-elearning-essential-3-reasons/>
- Lee, N.J., Chae, S.M., Kim, H., Lee, J.H., Min, H. J., & Park, D.E. (2016). Mobile-Based Video Learning Outcomes in Clinical Nursing Skill Education: A Randomized Controlled Trial. *Computers, Informatics, Nursing*, 34(1), 8–16.
- Lee, H., Parsons, D., Kwon, G., Kim, J., Petrova, K., Jeong, E., & Ryu, H. (2016). Cooperation begins: Encouraging critical thinking skills through cooperative reciprocity using a mobile learning game. *Computers & Education*, 97, 97-115.
- Lemaire, J. (2011). *Scaling Up Mobile Health: Elements Necessary for the Successful Scale Up of mHealth in Developing Countries*. White paper commissioned by Advanced Development for Africa. Retrieved from https://www.k4health.org/sites/default/files/ADA_mHealth%20White%20Paper.pdf
- Leon, N., Schneider, H., & Daviaud, E. (2012). Applying a framework for assessing the health system challenges to scaling up mHealth in South Africa. *BMC Medical Informatics and Decision Making*, 12(1), 123.
- Le Roux, L.Z. & Khanyile, T.D. (2012). A cross-sectional survey to compare the competence of learners registered for the Baccalaureus Curationis programme using different learning approaches at the University of the Western Cape. *Curationis*, 34(1), 7 pages. doi.org/10.4102/Curationis.34i1.53
- Liebenberg, H., Chetty, Y., & Prinsloo, P. (2012). Student access to and skills in using technology in an open and distance learning context. *The International Review of Research in Open and Distributed Learning*, 13(4), 250-268.
- Li, K., Lee, L., Wong, S., Yau, I., & Wong, B. (2018). Effects of mobile apps for nursing students: learning motivation, social interaction and study performance. *Open Learning: The Journal of Open, Distance and e-Learning*, 1–16. doi:10.1080/02680513.2018.1454832

- Lillis, S., Gibbons, V., & Lawrenson R. (2010). The experience of final year medical students undertaking a general practice run with a distance education component. *Rural and Remote Health, 10*, 1 – 8.
- Lim, C.P., & Churchill, D. (2016). Mobile learning. *Journal of Interactive Learning, 24*(2), 273-276.
- Lim, T., Fadzil, M., & Mansor, N. (2011). Mobile learning via SMS at Open University Malaysia: Equitable, effective, and sustainable. *The International Review of Research in Open and Distributed Learning, 12*(2), 122-137.
- Lin, W. (2017). Exploring the Convergence of the Mobile Learning Mode in Network Environment and the Traditional Classroom Teaching Mode. *International Journal of Emerging Technologies in Learning, 12*(7), 170-181.
- Lincoln, Y.S., & Guba, E.G. (1985). *Naturalistic inquiry*. Newbury Park, CA: SAGE Publications.
- Lincoln, Y.S., & Guba, E.G. (2000). Paradigmatic controversies, contradictions and emerging confluences. In N.K. Denzin & Y.S. Lincoln (Eds.), *Handbook of Qualitative Research* (2nd ed., pp. 163-188). Thousand Oaks, CA: SAGE Publications.
- Liu, T. & Chu, Y. (2010). Using ubiquitous games in an English listening and speaking course: Impact on learning outcomes and motivation. *Computers & Education, 55*, 630-643.
- Liu, T.C., Wang, H.Y., Liang, J.K., Chan, T., Ko, H.W., & Yang, J.C. (2003). Wireless and mobile technologies to enhance teaching and learning. *Journal of Computer Assisted Learning, 19*(3), 371-382.
- Lofland, J. (2006). *Analyzing Social Settings: A Guide to Qualitative Observation and Analysis*. (4th ed.). Belmont, CA: Wadsworth/Thomson Learning.
- Löfmark, A., Thorkildsen, K., Raholm, M., & Natvig, G.K. (2012). Nursing students' satisfaction with supervision from preceptors and teachers during clinical practice. *Nurse Education in Practice, 12*(3), 164-169.

- Loghmani, T.M., Bayliss, A.J., Strunk, V. & Altenburger, P. (2011). An Integrative, Longitudinal Case-Based Learning Model as a Curriculum Strategy to Enhance Teaching and Learning. *Journal of Physical Therapy Education*, 25(2), 42–50.
- Longhurst, R. (2016). Semi-structured interviews and focus groups. In N. Clifford, M. Cope, T. Gillespie, & S. French (Eds.), *Key Methods in Geography*. (3rd ed., pp. 143–156). London: SAGE Publications.
- Lowendal, J.M. (2016). Gartner 2016 Hype Cycle. In J. Gary (2016). *Hype Cycle of Education IT*. Retrieved from
http://moka.emporia.edu/uploads/moka_presentations/2016_Hype_Cycle_Education_IT.pdf
- Lundin, J. & Dumont, G. (2017). Medical mobile technologies – what is needed for a sustainable and scalable implementation on a global scale? *Global Health Action*, 10(3), 14 – 17.
- Luxton, D.D., McCann, R.A., Bush, N.E., Mishkind, M.C., & Reger, G.M. (2011). mHealth for mental health: Integrating smartphone technology in behavioral healthcare. *Professional Psychology: Research and Practice*, 42(6), 505.
- Mabuda, B.T., Potgieter, E., & Alberts, U.U. (2008). Student nurses' experiences during clinical practice in the Limpopo Province. *Curationis*, 31(1), 19-27.
- Madeira, R.N., Sousa, J.L., Pires, V.F., Esteves, L., & Dias, O.P. (2009). A mobile and web-based student learning system. *Procedia-Social and Behavioral Sciences*, 1(1), 2441-2448.
- Madianou, M. (2014). Smartphones as Polymedia. *Journal of Computer-Mediated Communication*, 19, 667–680.
- Makoe, M. 2012. Teaching digital natives: Identifying competencies for mobile learning facilitators in distance education. *South African Journal of Higher Education*, 26(1), 91–104.

- Mamudu, P.A., & Oyewo, A.O. (2015). Use of mobile phones for academic purposes by law students of Igbinedion University, Okada Nigeria. *International Journal of Library Science*, 4(4), 65-72.
- Mannix, E., & Neale, M.A. (2005). What differences make a difference? The promise and reality of diverse teams in organizations. *Psychological Science in the Public Interest*, 6(2), 31-55.
- Martin, A. (2016). Assessing the effect of constructivist YouTube video instruction in the spatial information sciences on student engagement and learning outcomes. *Irish Journal of Academic Practice*, 5(1), 1-21. Retrieved from <http://arrow.dit.ie/ijap/vol5/iss1/9>
- Masters, K., Ellaway, R.H., Topps, D., Archibald, D., & Hogue, R.J. (2016). Mobile technologies in medical education: AMEE Guide No. 105. *Medical Teacher*, 38(6), 537-549.
- Mather, C.A., Gale, F., & Cummings, E.A. (2017). Governing mobile technology use for continuing professional development in the Australian nursing profession. *BMC Nursing*, 16, 17. Retrieved from <http://doi.org/10.1186/s12912-017-0212-8>
- Mathison, D.L. (1988). Business ethics cases and decision models: A call for relevancy in the classroom. *Journal of Business Ethics*, 7(10), 777-782.
- Mbodila, M., Ndebele, C., & Muhandji, K. (2014). The effect of social media on student's engagement and collaboration in higher education: A case study of the use of Facebook at a South African university. *Journal of Communications*, 5(20), 115-125.
- McAndrew, M. & Johnston, E.A. (2012). The role of social media in dental education. *Journal of Dental Education*, 76 (11), 1474-1481.
- McKenney, S. & Reeves, T. (2012). *Conducting educational design research*. London: Routledge.
- McLeod, S.A. (2012). Zone of proximal development. Retrieved from <https://www.simplypsychology.org/Zone-of-Proximal-Development.html>

- McNulty, N. (2016). *Mobile learning in Africa: How mobile educational technology benefits learners*. Retrieved from <https://www.niallmcnulty.com/2016/06/mobile-learning-in-africa-how-mobile-educational-technology-benefits-learners/>
- Measuring the Information Society Report. (2015). Geneva, Switzerland: International Telecommunication Union. Retrieved from <https://www.itu.int/en/ITU-D/Statistics/Documents/publications/misr2015/MISR2015-w5.pdf>
- Meo, S.A. (2013). Basic steps in establishing effective small group teaching sessions in medical schools. *Pakistan Journal of Medical Sciences*, 29(4), 1071–1076.
- Merzifonluoglu, A., & Gonulal, T. (2018). Review of Digital language learning and teaching: Research, theory, and practice. *Language Learning & Technology*, 22(1), 65-68.
- Minocha, S. (2009). Role of social software tools in education: a literature review. *Education Training*, 51(5/6), 353-369.
- Montrieux, H., Vanderlinde, R., Schellens, T., & De Marez, L. (2015). Teaching and learning with mobile technology: A qualitative explorative study about the introduction of tablet devices in secondary education. *PloS One*, 10(12), e0144008. Retrieved from <https://doi.org/10.1371/journal.pone.0144008>
- Moore, G.E. (1965). Cramming More Components onto Integrated Circuits. *Electronics Magazine*, 38 (8), 114-117.
- Mosawi, A.A., & Wali, E.A. (2015). Exploring the Potential of Mobile Applications to Support Learning and Engagement in Elementary Classes. *International Journal of Mobile and Blended Learning*, 7(2), 33-44.
- Msiska, G., Smith, P., & Fawcett, T. (2014). The “lifeworld” of Malawian undergraduate student nurses: The challenge of learning in resource poor clinical settings. *International Journal of Africa Nursing Sciences*, 1, 35-42.

- Mullen, R., & Wedwick, L. (2008). Avoiding the digital abyss: Getting started in the classroom with YouTube, digital stories, and blogs. *The Clearing House: A Journal of Educational Strategies, Issues and Ideas*, 82(2), 66-69.
- Muñoz-Reyes, C. (2014). *Bridging the Digital and Knowledge Gap in Rural Communities through Mobile Learning*. Retrieved from <http://www.wise-qatar.org/mobile-learning-rural-communities>
- Munoz, C., & Towner, T. (2011). Back to the 'wall': Facebook in the college classroom. *First Monday. Peer Reviewed Journal of the Internet*, 16(12), 1 - 12.
- Murphy, F., Rosser, M., Bevan, R., Warner, G., & Jordan, S. (2012). Nursing students' experiences and preferences regarding hospital and community placements. *Nurse Education Practice*, 12(3), 170-175.
- Myers, M. D. (2013). *Qualitative research in business and management*. (2nd ed.). London: SAGE Publications.
- Naicker, N. & van der Merwe, T.M. (2012). Mobile learning in higher education: a study of the technology readiness of students at a South African higher education institution. *Proceedings of the 14th Annual Conference on World Wide Web Applications*. Durban, 7-9 November 2012. ISBN: 978-0-620-55590-6
- Naismith, L., Lonsdale, P., Vavoula, G., & Sharples, M. (2004). Literature Review in Mobile Technologies and Learning. *FutureLab Series, Report, 11*, 48. Bristol: University of Birmingham. Retrieved from <https://telearn.archives-ouvertes.fr/hal-00190143/document>
- Nardi, B. (2007). Placeless organizations: Collaborating for transformation. *Mind, Culture and Activity. An International Journal*, 14(1/2), 5-22.
- Nasi, G., Cucciniello, M., & Guerrazzi, C. (2015). The Role of Mobile Technologies in Health Care Processes: The Case of Cancer Supportive Care. *Journal of Medical Internet Research*, 17(2), e26. Retrieved from <http://doi.org/10.2196/jmir.3757>

- Nasri, N.M. (2017). Self-directed learning through the eyes of teacher educators. *Kasetsart Journal of Social Sciences*, xxx, 1-8. Retrieved from <http://dx.doi.org/10.1016/j.kjss.2017.08.006>
- National Plan for Higher Education. (2001). Ministry of Education, Pretoria: Government Printers.
- Ngabo, F., Nguimfack, J., Nwaigwe, F., Mugeni, C., Muhoza, D., Wilson, D. R., ... Binagwaho, A. (2012). Designing and Implementing an Innovative SMS-based alert system (RapidSMS-MCH) to monitor pregnancy and reduce maternal and child deaths in Rwanda. *The Pan African Medical Journal*, 13, 31.
- Ng'ambi, D., & Bozalek, V. (2016) Learning technologies in developing nations. In N. Rushby, & D. Surry (Eds.), *The Wiley Handbook of Educational Technology* (pp. 200-220). West Sussex, UK: John Wiley & Sons.
- Ng'ambi, D., Brown, C., Bozalek, V., Gachago, D., & Wood, D. (2016), Technology enhanced teaching and learning in South African higher education – A rearview of a 20-year journey. *British Journal of Educational Technology*, 47, 843–858.
- Ng'ambi, D., & Goodman, S. (2009). Bridging distance between actual and potential development: A case of using ICT mediated consultation tool. *Education and Information Technologies*, 14(1), 89-102.
- Ng, W. & Nicholas, W. (2016). Sustaining innovation in learning with mobile devices: Key challenges. In W. Ng, & T.M. Cummings (Eds.). *Sustaining mobile learning: Theory, research and practice* (pp.1-26). New York, NY: Routledge.
- Nicholson, S. (2002). Socialization in the “virtual hallway”: Instant messaging in the asynchronous web-based distance education classroom. *The Internet and Higher Education*, 5(4), 363-372.
- Nie, N.H., & Erbring, L. (2000). Internet and society. *Stanford Institute for the Quantitative Study of Society*, 3, 14-19.

- Nie, N.H., Hillygus, D.S., & Erbring, L. (2002). Internet Use, Interpersonal Relations and Sociability: A Time Diary Study. In B. Wellman, & C. Haythornthwaite (Eds.), *Internet and Everyday Life* (pp. 215-243). London: Blackwell.
- Nielsen, J. (1998). Nielsen's law of internet bandwidth. Retrieved from <https://www.nngroup.com/articles/law-of-bandwidth/>
- Nkomo, M. (2000). The National Qualifications Framework and Curriculum Development. Retrieved from http://www.saqa.org.za/docs/pol/2000/curriculum_dev.pdf
- Nkosi, Z., Pillay, P., & Nokes, K.M. (2013). Implementing case-based teaching strategies in a decentralised nursing management programme in South Africa. *Curationis*, 36(1), 1-6.
- Nordin, N., Embi, M.A., & Yunus, M.M. (2010). Mobile learning framework for lifelong learning. *Procedia - Social and Behavioral Sciences*, 7, 130-138.
- Nordstrom, C.R., Wendland, D., & Williams, K.B. (1998). "To err is human": An examination of the effectiveness of error management training. *Journal of Business and Psychology*, 12(3), 269-282.
- Norton, P. (2003). COPLS: An alternative to traditional online course management tools. Charlottesville, VA: Association for the Advancement of Computing in Education.
- Nyhssen, C.M., Steinberg, L.J., & O'Connell, J.E. (2013). Undergraduate radiology teaching from the student's perspective. *Insights into Imaging*, 4(1), 103-109.
- Pacansky-Brock, M. (2017). Why Online Classes Matter. Retrieved from <http://brocansky.com/2017/06/why-online-classes-matter.html>
- Pachler, N., Bachmair, B., & Cook, J. (2010). *Mobile Learning: Structures, Agency, Practices*. London: Springer.
- Palloff, R.M., & Pratt, K. (2007). *Building online learning communities: Effective strategies for the virtual classroom*. (2nd ed.). San Francisco, CA: Jossey-Bass.

- Pålsson, Y., Mårtensson, G., Swenne, C.L., Ädel, E., & Engström, M. (2017). A peer learning intervention for nursing students in clinical practice education: A quasi-experimental study. *Nurse Education Today*, 51, 81 – 87.
- Panetta, K. (2016). *Gartner's top 10 strategic technology trends for 2017*. Retrieved from <https://www.gartner.com/smarterwithgartner/gartner-top-10-strategic-technology-trends-for-2018/>
- Park, G., Johnson, H., Vath, R., Kubitskey, B., & Fishman, B. (2013). Examining the Roles of the Facilitator in Online and Face-to-Face Professional Development Contexts. *Journal of Technology and Teacher Education*, 21(2), 225-245.
- Park, C., Van Neste-Kenny, J., Burton, P., & Kenny, R. (2010). A model of mobile faculty presence in nursing education practice. *Canadian Journal of Nursing Informatics*, 5(3), 21 – 42.
- Patton, M.Q. (2002). Designing qualitative studies. *Qualitative Research and Evaluation Methods*. (3rd ed.). Thousand Oaks, CA: SAGE Publications.
- Patton, M.Q. (2015). *Qualitative Evaluation and Research Methods*. (4th ed.). Thousand Oaks, CA: SAGE Publications.
- Petraglia, J. (1998). *Reality by design: The rhetoric and technology of authenticity in education*. New Jersey: Routledge.
- Phuma-Ngaiyaye, E., Bvumbwe, T., & Chipeta, M. C. (2017). Using preceptors to improve nursing students' clinical learning outcomes: A Malawian student's perspective. *International Journal of Nursing Sciences*, 4(2), 164-168.
- Pimmer, C., Brühlmann, F., Odetola, T.D., Dipeolu, O., Gröhbiel, U., & Ajuwon, A.J. (2018). Instant messaging and nursing students' clinical learning experience. *Nurse Education Today*, 64, 119-124.
- Pimmer, C., & Pachler, N. (2014). Mobile learning in the workplace: Unlocking the value of mobile technology for work-based education. In M. Ally, & A. Tsinakos (Eds),

- Increasing Access through Mobile Learning* (pp.193-204). Vancouver: Commonwealth of Learning and Athabasca University.
- Pitler, H., Hubbell, E., Kuhn, M., & Malenoski, K. (2007). *Using Technology with Classroom Instruction that Works*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Plano Clark, V. L., & Creswell, J. W. (2010). *Understanding Research: A Consumer's Guide*. Upper Saddle River, NJ: Pearson.
- Polit, D.F., & Beck C.T. (2018). *Essentials of nursing research: appraising evidence for nursing practice*. (9th ed.). Philadelphia: Wolters Kluwer Health.
- Prensky, M. (2010). *Teaching Digital Natives: Partnering for Real Learning*. Thousand Oaks, CA: Corwin Press.
- Raman, J. (2015). Mobile technology in nursing education: Where do we go from here? A review of the literature. *Nurse Education Today*, 35(5), 663–672.
- Rambe, P., & Bere, A. (2013). Using mobile instant messaging to leverage learner participation and transform pedagogy at a South African University of Technology. *British Journal of Educational Technology*, 44(4), 544-561.
- Ramos, A. J. (2008). *Final report for sub-project #2, Project MIND: The viability of mobile SMS technologies for non-formal distance learning in Asia*. Philippines: Molave Development Foundation.
- Reid, J., Kamler, B., Simpson, A., & Maclean, R. (1996). “Do you see what I see?” Reading a different classroom scene. *Qualitative Studies in Education*, 9, 87-108.
- Reeves, D.B. (2006). *The learning leader: How to focus school improvement for better results*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Reeves, T.C., & Okey, J.R. (1996). Alternative assessment for constructivist learning environments. In B.G. Wilson (Ed.), *Constructivist learning environments: Case studies in instructional design* (pp. 191-202). Englewood Cliffs, NJ: Educational Technology Publications.

- Roberts, D.J., & Rylands, J., & Sinclair, D. (2016). Interventions using mobile devices (phones, smart phones, or tablets) to improve adherence to treatment for HIV or tuberculosis. *Cochrane Database of Systematic Reviews*, 9. Art. No.: CD012353. DOI: 10.1002/14651858.CD012353.
- Rossing, J.P., Miller, W.M., Cecil, A.K., & Stamper, S.E. (2012). iLearning: The future of higher education? Student perceptions on learning with mobile tablets. *Journal of the Scholarship of Teaching and Learning*, 12(2), 1-26.
- Rotter, J. (2015). How to protect your privacy on Facebook. Retrieved from <http://download.cnet.com/blog/download-blog/how-to-protect-your-privacy-on-facebook/>
- Rowe, M., Frantz, J., & Bozalek, V. (2013). Using Google Drive to facilitate a blended approach to authentic learning. *British Journal of Educational Technology*, 44, 594–606.
- Rubin, A., & Babbie, E.R. (2011). *Research Methods for Social Work*. Belmont, CA: Brooks/Cole Cengage Learning.
- Rule, P., & John, V. (2011). *Your guide to case study research*. Pretoria: Van Schaik Publishers.
- Rushby, N. (2012). Editorial: Learning technology—redefining the field. *British Journal of Educational Technology*, 43, 835–836.
- Rushbrooke, E., & Houston, K.T. (2015). *Telepractice in Audiology*. San Diego, CA: Plural Publishing.
- Russel, D., Gentsler, P.S., & Wood, L. (2014). Mobile Learning in Nursing Education: Lessons Learned. In: R. Huang, Kinshuk, & N. Chen (Eds.), *The New Development of Technology Enhanced Learning: Concept, Research and Best Practices* (pp 203-221). Heidelberg, Berlin: Springer.

- Ryu, H., & Parsons, D. (2009). Designing learning activities with mobile technologies. In H. Ryu, & D. Parsons (Eds.), *Innovative mobile learning* (pp. 1-20). Hershey: Information Science Reference.
- Salomon, G. (1993). *Distributed cognitions: Psychological and educational considerations*. Cambridge: Cambridge University Press.
- Samadzadeh, G.R., Rigi, T., & Ganjali, A.R. (2013). Comparison of Four Search Engines and their efficacy With Emphasis on Literature Research in Addiction (Prevention and Treatment). *International Journal of High Risk Behaviors and Addiction*, 1(4), 166-71.
- Sankaranarayanan, J., & Sallach, R.E. (2014). Rural patients' access to mobile phones and willingness to receive mobile phone-based pharmacy and other health technology services: a pilot study. *Telemedicine and e-Health*, 20(2), 182-185.
- Sarrab, M., Elgamel, L., & Aldabbas, H. (2012). Mobile learning (m-learning) and educational environments. *International Journal of Distributed and Parallel Systems*, 3(4), 31-38.
- Saunders, M., Lewis, P., & Thornhill, A. (2012). *Research Methods for Business Students*. (4th ed.). Essex, England: Pearson Education.
- Schrøder, M.C., & Petersen, D.B. (2013). Effect of a pocket size guideline book in the emergency department; a questionnaire study. *Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine* 2013, 21(2), A23. Retrieved from <http://www.sjtrem.com/content/21/S2/A23>
- Schroeder, S. (2012). Facebook Hits One Billion Active Users (2012). Retrieved from <http://mashable.com/2012/10/04/facebook-one-billion/#BFVDyyaefEqU>
- Schurink, W.J., Schurink, E.M., & Poggenpoel, M. (2011). Focus group interviewing and audiovisual methodology in qualitative research. In A.S. De Vos, H. Strydom, C.B. Fouché, & C.S.L. Delport (Eds.), *Research at grass roots, a primer in care professions*. (pp. 313-333). Pretoria: Van Schaik Publishers.

- Schwandt, T. (2015). *Dictionary of Qualitative Inquiry*. (4th ed.). Thousand Oaks, CA: SAGE Publishers.
- Seekoe, E. (2014). A model for mentoring newly-appointed nurse educators in nursing education institutions in South Africa. *Curationis*, 37(1), 1-8.
- Serdyukov, P. (2017). Innovation in education: what works, what doesn't, and what to do about it? *Journal of Research in Innovative Teaching & Learning*, 10(1), 4-33.
- Shahbar, K., & Zincir-Heywood, A.N. (2017). Effects of shared bandwidth on anonymity of the I2P network users. In *38th IEEE Symposium on Security and Privacy Workshops, 2nd International Workshop on Traffic Measurements for Cybersecurity*, May 2017.
- SHarahia, B.Y., Ahmadi, A., Goodarzi, T., Beigi, F.H., & Joukar, J. (2014). A Survey of the Amount of Internet Usage among High School Students of Khafr County and its Impacts on Students. *Social and Behavioral Sciences*, 114, 610 – 616.
- Sharples, M., McAndrew, P., Weller, M., Ferguson, R., FitzGerald, E., Hirst, T., Mor, Y., Gaved, M., & Whitelock, D. (2012). *Innovating pedagogy 2012: Open University Innovation Report 1*. Milton Keynes: The Open University
- Sharples, M., de Roock, R., Ferguson, R., Gaved, M., Herodotou, C., Koh, E., Kukulska-Hulme, A., Looi, C.K., McAndrew, P., Rienties, B., Weller, M., & Wong, L.H. (2016). *Innovating Pedagogy 2016: Open University Innovation Report 5*. Milton Keynes: The Open University.
- Sharples, M., Taylor, J., & Vavoula, G. (2007). A theory of learning for the mobile age. In R. Andrews, & C. Haythornthwaite (Eds.), *The Sage Handbook of Elearning Research* (pp. 221-47). London: SAGE Publishers.
- Shattuck, J., & Anderson, T. (2013). Using a design-based research study to identify principles for training instructors to teach online. *The International Review of Research in Open and Distributed Learning*, 14(5). doi:<http://dx.doi.org/10.19173/irrodl.v14i5.1626>

- Shenton, A. (2004). Strategies for ensuring trustworthiness in qualitative research projects. *Education for Information, 22*, 63-75.
- Shurville, S., O'Grady, T.B., & Mayall, P. (2008). Educational and institutional flexibility of Australian educational software. *Campus-Wide Information Systems, 25*(2), 74-84.
- Siddiq, F., Scherer, R., & Tondeur, J. (2016). Teachers' emphasis on developing students' digital information and communication skills (TEDDICS): A new construct in 21st century education. *Computers & Education, (92-93)*, 1-14.
- Siemens, G., & Tittenberg, P. (2009). *Handbook of Emerging technologies for learning*. Manitoba, Canada: University of Manitoba.
- Silva, H.S., Bariani, R.C., Kubo, H., Leal, T.P., Ilinsky, R., Borges, T., Faltin, K., & Ortolani, C.L.F. (2017). The Use of Technologies for Teaching Dentistry in Brazil: Reflections from an Integrative Review. *International Education Studies, 10*(4), 172-178.
- Silver, D. (2011). Using the 'Zone' Help Reach Every Learner. *Kappa Delta Pi Record, 47*(1), 28-31.
- Sincero, S.M. (2012). *Surveys and Questionnaires - Guide*. Retrieved from Explorable.com: <https://explorable.com/surveys-and-questionnaires>
- Siniscalco, M. T., & Auriat, N. (2005). *Quantitative research methods in educational planning: Questionnaire design*. Paris, France: UNESCO International Institute for Educational Planning.
- Sølvberg, A.M., & Rismark, M. (2012). Learning spaces in mobile learning environments. *Active Learning in Higher Education, 13*(1), 23 – 33.
- Song, H.S.Y., Murphy, A., & Farley, H. (2013). Mobile devices for learning in Malaysia: Then and now. In H. Carter, M. Gosper, & J. Hedberg (Eds.), *Electric Dreams. Proceedings ascilite* (pp. 830-834). Sydney. Retrieved from <http://www.ascilite.org/conferences/sydney13/program/papers/Song.pdf>

- Spies, D. (2017). Malema calls on former matrics to report to academic institutions in 2018. Retrieved from <https://www.news24.com/SouthAfrica/News/malema-calls-on-former-matrics-to-report-to-academic-institutions-in-2018-20171230>
- Spradley, J.P. (2016). *Participant Observation*. Long Grove, Illinois: Waveland Press.
- Stephens, K.K., Houser, M.L., & Cowan, R.L. (2009). RU able to meat me: The impact of students' overly casual email messages to instructors. *Communication Education*, 58(3), 303-326.
- Stevens, D., & Kitchenham, A. (2011). An Analysis of mobile learning in education, business and medicine. In A. Kitchenham (Ed.), *Models for interdisciplinary mobile learning: Delivering information to students* (pp. 1-25). doi:10.4018/978-1-60960-511-7.ch001
- Stoop, I., & Harrison, E. (2012). Classification of Surveys. In: Gideon L. (Ed.), *Handbook of Survey Methodology for the Social Sciences* (pp. 7-21). New York, NY: Springer.
- Strauss, A., & Corbin, J. M. (1998). *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory*. (2nd ed.). Thousand Oaks, CA: SAGE Publications.
- Sumi, Y., Etani, T., Felsy, S., Simonetz, N., Kobayashix, K., & Mase, K. (1998). C-MAP: Building a Context-Aware Mobile Assistant for Exhibition Tours. In T. Ishida (Ed.), *Community Computing and Support Systems* (pp. 137-154). Berlin: Springer-Verlag.
- Sung, Y., Chang, K., & Liu, T. (2016). The effects of integrating mobile devices with teaching and learning on students' learning performance: A meta-analysis and research synthesis. *Computers & Education*, 94, 252-275.
- Susilo, A. (2014). Exploring Facebook and Whatsapp As Supporting Social Network Applications for English Learning in Higher Education. Open University Malaysia, 10-24. 11-12 June 2014, Park Hotel Bandung. <http://repository.ut.ac.id/id/eprint/4930>
- Sutton, J., & Austin, Z. (2015). Qualitative Research: Data Collection, Analysis, and Management. *The Canadian Journal of Hospital Pharmacy*, 68(3), 226–231.

- Tappen, R. M. (2011). *Advanced nursing research: From theory to practice*. Sudbury, MA: Jones & Bartlett Learning.
- Teddlie, C., & Tashakkori, A. (2009). *Foundations of mixed methods research: Integrating quantitative and qualitative approaches in the social and behavioral sciences*. Thousand Oaks, California: SAGE Publications.
- Terre Blanche, M. S., Durrheim, K., & Painter, D. (2014). *Research in practice: Applied methods for the social sciences*. Cape Town: Juta Publishers.
- Tesch, R. (1990). *Qualitative analysis: Analysis types and software tools*. London: Falmer Press.
- The digital divide in South Africa's higher education sector: why public internet access is important in the context of tertiary education. (2017). Retrieved from <http://www.polity.org.za/article/the-digital-divide-in-south-africas-higher-education-sector-why-public-internet-access-is-important-in-the-context-of-tertiary-education-2017-08-15>
- Thistlethwaite, J.E., Davies, D., Ekeocha, S., Kidd, J.M., MacDougall, C., Matthews, P., Purkis, J., & Clay, D. (2012). The effectiveness of case-based learning in health professional education. A BEME systematic review. BEME Guide No. 23. *Medical Teacher*, 34(6), e421-e444. doi: 10.3109/0142159X.2012.680939
- Tobin, G. A., & Begley, C. M. (2004). Methodological rigour within a qualitative framework. *Journal of Advanced Nursing*, 48(4), 388-396.
- Tondeur, J., Aesaert, K., van Braak, J., Pynoo, B., Freyman, N., & Erstadt, O. (2017). Developing a validated instrument to measure pre-service teachers' ICT competencies: meeting the demands of the 21st-century. *British Journal of Educational Technology*, 48(2), 462-472.
- Traxler, J. (2007). Defining, discussing and evaluating mobile learning: The moving finger writes and having writ.... *The International Review of Research in Open and Distributed Learning*, 8(2), 1-12.

- Traxler, J. (2010). Will Student Devices Deliver Innovation, Inclusion & Transformation? *Journal of the Research Center for Educational Technology at Kent State University*, 6(1), 3-15.
- Traxler, J. (2011). Mobile Learning - Starting in the Right Place, Going in the Right Direction? *International Journal of Mobile and Blended Learning*, 3(1), 57 - 67.
- Traxler, J. (2018). Mobile Learning: The Philosophical Challenges, Problems and Implications of Defining and Theorising. *South African Journal for Open and Distance Learning Practice*, 38(1). Retrieved from <https://upjournals.co.za/index.php/Progressio/article/view/1785>
- Traxler, J., & Kukulska-Hulme, A. (Eds.). (2016). *Mobile Learning: The Next Generation*. London: Routledge.
- Tutkun, Ö.F. (2011). Internet Access, Use and Sharing Levels Among Students During the Teaching-learning Process. *Turkish Online Journal of Educational Technology*, 10(3), 152-160.
- United Nations Educational, Scientific and Cultural Organisation. (2013). *Education for the 21st century*. Retrieved from <http://unesdoc.unesco.org/images/0022/002271/227146e.pdf>
- Uzunboylu, H., Cavus, N., & Ercag, E. (2009). Using mobile learning to increase environmental awareness. *Computers & Education*, 52(2), 381-389.
- Valk, J., Rashid, A.T., & Elder, L. (2010). Using mobile phones to improve educational outcomes: An analysis of evidence from Asia. *The International Review of Research in Open and Distributed Learning*, 11(1), 117-140.
- van den Akker, J., Gravemeijer, K., McKenney, S., & Nieveen, N. (Eds.). (2006). *Educational design research*. London: Routledge.
- Vavoula, G., Pachler, N., & Kukulska-Hulme, A. (2009). *Researching mobile learning: frameworks, tools and research designs*. Oxford, UK: Peter Lang.

- Veletsianos, G. (2010). *Emerging technologies in distance education*. Athabasca University Press.
- Ventola, C. L. (2014). Mobile devices and apps for health care professionals: Uses and benefits. *Pharmacy and Therapeutics*, 39(5), 356.
- Virvou, M., Troussas, C., & Alepis, E. (2012). Machine learning for user modelling in a multilingual learning system. Paper presented at the *Information Society (i-Society), 2012 International Conference*, 292 - 297.
- Vivekanantham, S., & Ravindran, R.P. (2014). Technology: changing the focus of medical education? *Advances in Medical Education and Practice*, 5, 25-26.
- Vivian, R., Barnes, A., Geer, R., & Wood, D. (2014). The academic journey of university students on Facebook: an analysis of informal academic-related activity over a semester. *Research in Learning Technology*, 22, 1-16.
- Vygotsky, L. S. (1962). *Thought and language*. Cambridge, Massachusetts: Massachusetts Institute of Technology.
- Vygotsky, L. S. (1978). *Mind in society: The development of higher mental process*. Cambridge, Massachusetts: Harvard University Press.
- Wagner, E. D. (2005). Enabling M-learning. *Educause Review*, 40(3), 40-53.
- Walters, C. (2005). Kryder's Law. *Scientific American Magazine*. Retrieved from <http://www.scientificamerican.com/article/kryders-law>
- Walton, G., Childs, S., & Blenkinsopp, E. (2005). Using mobile technologies to give health students access to learning resources in the UK community setting. *Health Information & Libraries Journal*, 22(2), 51-65.
- Wang, F., & Hannafin, M. J. (2005). Design-based research and technology-enhanced learning environments. *Educational Technology Research and Development*, 53(4), 5-23.

- Wang, Q., Woo, H. L., Quek, C. L., Yang, Y., & Liu, M. (2012). Using the Facebook group as a learning management system: An exploratory study. *British Journal of Educational Technology*, 43(3), 428- 438.
- Watson, R., McKenna, H., Cowman, S., & Keady, J. (2008). *Nursing research: Designs and methods E-book*. Edinburgh: Elsevier Health Sciences.
- Wenmoth, D. (2017). The Education Issue: Why flexible learning environments? Retrieved from <https://www.stuff.co.nz/national/education/95923387/the-education-issue-why-flexible-learning-environments>
- Westera, W. (1999). Paradoxes in open, networked learning environments: Toward a paradigm shift. *Educational Technology*, 39(1), 17-23.
- Wexler, S., Brown, J., Metcalf, M., Rogers, D., & Wagner, E. (2008). 360°Report: Mobile learning. Santa Rosa, USA: eLearning Guild.
- Willemse, J.J., (2015). Undergraduate nurses' reflections on Whatsapp use in improving primary health care education. *Curationis*, 38(2), Art. #1512, 7 pages. Retrieved from <http://dx.doi.org/10.4102/curationis.v38i2.1512>
- Willemse, J.J., & Bozalek, V. (2015). Exploration of the affordances of mobile devices in integrating theory and clinical practice in an undergraduate nursing programme. *Curationis*, 38(2), Art. #1510, 10 pages. Retrieved from <http://dx.doi.org/10.4102/curationis.v38i2.1510>
- Willemse, J.J., Jooste, K., & Bozalek, V. (2014). Perceptions of students and educators on the potential use of mobile devices in an undergraduate nursing module. *African Journal for Physical, Health Education, Recreation and Dance*, 1(1), 179-196.
- Williams, A., Cassella, J.P., & Maskell, P.D. (Eds.). (2017). *Forensic Science Education and Training: A Tool-kit for Lecturers and Practitioner Trainers*. West Sussex, UK: John Wiley & Sons.
- Williamson, K. M., & Muckle, J. (2018). Students' Perception of Technology Use in Nursing Education. *Computers, Informatics, Nursing Journal*, 36(2), 70–76.

- Wilson, M., & Bolliger, D. U. (2013). Mobile learning: Endless possibilities for allied health educators. *Journal of Diagnostic Medical Sonography*, 29(5), 220-224.
- Witt, R.E., Kebaetse, M.B., Holmes, J.H., Littman-Quinn, R., Ketshogileng, D., Antwi, C., Kovarik, C., & Nkomazana, O. (2016). The role of tablets in accessing information throughout undergraduate medical education in Botswana. *International Journal of Medical Informatics*, 88, 71-77.
- Wood, D., Bruner, J. S., & Ross, G. (1976). The role of tutoring in problem solving. *Journal of Child Psychology and Psychiatry*, 17, 89–100.
- Woods, D., Attwell, A., Ross, K., & Theron, G. (2012). Text messages as a learning tool for midwives. *South African Medical Journal*, 102(2), 100-101.
- Woolfolk, A. (2010). Educational psychology. (11th ed.). Upper Saddle River, New Jersey: Merrill.
- Wright, K. B. (2006). Researching internet-based populations: Advantages and disadvantages of online survey research, online questionnaire authoring software packages, and web survey services. *Journal of Computer-Mediated Communication*, 10(3), 00. Retrieved from <https://doi.org/10.1111/j.1083-6101.2005.tb00252.x>
- Yeboah, J., & Ewur, G. D. (2014). The impact of WhatsApp messenger usage on students' performance in tertiary institutions in Ghana. *Journal of Education and Practice*, 5(6), 157-164.
- Yin, R.K. (2009). *Case Study Research: Design and Methods*. London: SAGE Publishers.
- Yu, A. Y., Tian, S. W., Vogel, D., & Kwok, R. C. (2010). Embedded social learning in online social networking. In *ICIS 2010 Proceedings, Thirty First International Conference on Information Systems*. Retrieved from https://aisel.aisnet.org/icis2010_submissions/100
- Yun, G. W., & Trumbo, C. W. (2000). Comparative response to a survey executed by post, e-mail, & web form. *Journal of Computer-Mediated Communication*, 6(1), 0. Retrieved from <https://doi.org/10.1111/j.1083-6101.2000.tb00112.x>

- Zain, S.F.H.S., Rasidi, F.E.M., & Abidin, I.I.Z. (2012). Student-Centred Learning in Mathematics–Constructivism in The Classroom. *Journal of International Education Research*, 8(4), 319-328.
- Zimmerman, D. W. (1994), Simplified interaction tests for non-normal data in psychological research. *British Journal of Mathematical and Statistical Psychology*, 47, 327–335.
- Zickuhr, K. (2010). Generations Online in 2010. Retrieved from <http://www.pewinternet.org/2010/12/16/generations-2010/>



ANNEXURES

- Annexure 1 PERMISSION REQUEST - THE DEAN OF RESEARCH
- Annexure 2 APPROVED METHODOLOGY AND ETHICS REGISTRATION
- Annexure 3 PERMISSION REQUEST – DIRECTOR OF THE SCHOOL OF NURSING
- Annexure 4 PERMISSION TO CONDUCT THE STUDY: DIRECTOR SCHOOL OF NURSING
- Annexure 5 PERMISSION LETTER - THE WESTERN CAPE DEPARTMENT OF HEALTH
- Annexure 6 PERMISSION TO CONDUCT THE STUDY AT THE WESTERN CAPE PROVINCE DEPARTMENT OF HEALTH CENTRES
- Annexure 7 PARTICIPANT INFORMATION SHEET
- Annexure 8 PARTICIPANT INFORMED CONSENT FORM ELECTRONIC SURVEY
- Annexure 9 FOCUS GROUP PARTICIPANT INFORMED CONSENT FORM
- Annexure 10 FOCUS GROUP CONFIDENTIALITY BINDING FORM
- Annexure 11 INDIVIDUAL INTERVIEW CONSENT FORM
- Annexure 12 INDIVIDUAL INTERVIEW SCHEDULE

- Annexure 13 PATIENT CONSENT FORM
- Annexure 14 STUDENT SURVEY
- Annexure 15 STUDENT SURVEY RESULTS
- Annexure 16 SURVEY OF LECTURERS AND CLINICAL FACILITATORS
- Annexure 17 SURVEY RESULTS: LECTURERS AND CLINICAL FACILITATORS
- Annexure 18 EXAMPLE OF A TRANSCRIPT – FOCUS GROUP WITH STUDENTS
- Annexure 19 EXAMPLE OF A TRANSCRIPT – FOCUS GROUP WITH LECTURERS AND CLINICAL FACILITATORS
- Annexure 20 EXAMPLE OF A TRANSCRIPT – INDIVIDUAL INTERVIEW WITH A STUDENT
- Annexure 21 EXAMPLE OF A TRANSCRIPT – INDIVIDUAL INTERVIEW WITH A CLINICAL FACILITATOR
- Annexure 22 EXAMPLES OF ELECTRONIC REFLECTIONS FROM STUDENTS
- Annexure 23 2016 PRIMARY CARE AND CLINICAL SKILLS MODULE

Annexure 24 REVIEW OF THE PRIMARY CARE AND CLINICAL SKILLS
MODULE BY A SPECIALIST IN THE FIELD

Annexure 25 EXAMPLE OF THE NOTIFICATION OF COMPLETION OF
TRAINING (R425, 1985, AS AMMENDED)



UNIVERSITY *of the*
WESTERN CAPE

ANNEXURE 1: PERMISSION REQUEST - THE DEAN OF RESEARCH



UNIVERSITY OF THE WESTERN CAPE

Private Bag X 17, Bellville 7535, South Africa

Tel: +27 21-9592274, Fax: 27 21-9592271

Dean of Research

University of the Western Cape

Private Bag X 17

Bellville 7535



REQUESTING PERMISSION TO CONDUCT A RESEARCH STUDY AT THE UNIVERSITY OF THE WESTERN CAPE

I hereby wish to request permission to conduct a research study at the School of Nursing at the University of the Western Cape.

The study is entitled: The affordances of m-learning for an undergraduate nursing programme: A design-based study.

This study is part of the requirements for acquiring a PhD in Nursing Science and the study will be done under your direct supervision and guidance.

Data will be obtained from an online survey, focus groups, individual interviews and online reflections. Participants will complete the online survey at a time and place of their convenience and it will take about 30 minutes to complete.

The researcher will adhere to the rights of participants to privacy and confidentiality. The identity of all participants will be protected; the questionnaires will be allocated code numbers. The name of the university will not appear on the research report. All records will be kept for 5 years after publication of the results after which it will be destroyed. Only the researcher, research supervisors, independent coder and statistician will have access to the data. The participants will not be coerced into participation and should they wish to withdraw at any time during the study, their wish will be respected.

The researcher will ensure adherence to the highest standards of research planning, implementation and reporting.

This research has been approved by the Senate Research Committee and Ethics Committee of the University of the Western Cape.

If you have any questions about the research study itself, please contact:

Researcher: Juliana Willemse

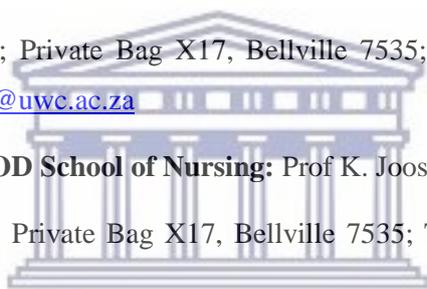
University of the Western Cape; Private Bag X17, Bellville 7535; Telephone: (021) 959 2258; Cell: 084 619 2968; Email: jjwillemse@uwc.ac.za

Research Supervisor/Acting HOD School of Nursing: Prof K. Jooste

University of the Western Cape; Private Bag X17, Bellville 7535; Telephone: (021) 959 2271; Email: kjooste@uwc.ac.za

Dean of the Faculty of Community and Health Sciences: Prof Hester Klopper

University of the Western Cape; Private Bag X17; Email: hklopper@uwc.ac.za



UNIVERSITY of the
WESTERN CAPE

ANNEXURE 2: APPROVED METHODOLOGY AND ETHICS REGISTRATION



**OFFICE OF THE DEAN
DEPARTMENT OF RESEARCH DEVELOPMENT**

12 December 2012

To Whom It May Concern

I hereby certify that the Senate Research Committee of the University of the Western Cape has approved the methodology and ethics of the following research project by:
Mrs J Willense (School of Nursing)

Research Project:

The affordances of mobile learning for an undergraduate nursing programme: A design-based study.

Registration no:

12/10/16

Any amendments, extension or other modifications to the protocol must be submitted to the Ethics Committee for approval.

The Committee must be informed of any serious adverse event and/or termination of the study.

*Ms Patricia Jostias
Research Ethics Committee Officer
University of the Western Cape*

Private Bag X17, Bellville 7535, South Africa
T: +27 21 959 2985/2948 . F: +27 21 959 3170
E: sp@uwc.ac.za / uwc@uwc.ac.za
www.uwc.ac.za



ANNEXURE 3: PERMISSION REQUEST – DIRECTOR OF THE SCHOOL OF NURSING



UNIVERSITY OF THE WESTERN CAPE

Private Bag X 17, Bellville 7535, South Africa

Tel: +27 21-9592274, Fax: 27 21-9592271

Prof Karien Jooste
 Acting Head of Department
 School of Nursing
 University of the Western Cape
 Private Bag X 17
 Bellville 7535



REQUESTING PERMISSION TO CONDUCT A RESEARCH STUDY AT THE SCHOOL OF NURSING AT THE UNIVERSITY OF THE WESTERN CAPE

I hereby wish to request permission to conduct a research study at a School of Nursing at this University.

The study is entitled: The affordances of m-learning for an undergraduate nursing programme: A design-based study.

This study is part of the requirements for acquiring a PhD in Nursing Science and the study will be done under your direct supervision and guidance.

Data will be obtained from an online survey, focus groups, individual interviews and online reflections. Participants will complete the online survey at a time and place of their convenience and it will take about 30 minutes to complete.

The researcher will adhere to the rights of participants to privacy and confidentiality. The identity of all participants will be protected; the questionnaires will be allocated code numbers. The name of the university will not appear on the research report. All records will be kept for 5 years after publication of the results after which it will be destroyed. Informed gathered in this study will not be available to any person, other than the researcher, research supervisors, independent coder and statistician.

The participants will not be coerced into participation and should they wish to withdraw at any time during the study, their wish will be respected.

The researcher will ensure adherence to the highest standards of research planning, implementation and reporting.

This research has been approved by the Senate Research Committee and Ethics Committee of the University of the Western Cape.

If you have any questions about the research study itself, please contact:

Researcher: Juliana Willemse

University of the Western Cape; Private Bag X17, Bellville 7535; Telephone: (021) 959 2258; Cell: 084 619 2968; Email: jjwillemse@uwc.ac.za

Research Supervisor/Acting HOD School of Nursing: Prof K. Jooste

University of the Western Cape; Private Bag X17, Bellville 7535; Telephone: (021) 959 2271; Email: kjooste@uwc.ac.za

Dean of the Faculty of Community and Health Sciences: Prof Hester Klopper

University of the Western Cape; Private Bag X17; Email: hklopper@uwc.ac.za

ANNEXURE 4: PERMISSION TO CONDUCT THE STUDY: DIRECTOR SCHOOL OF NURSING



Dear Mrs J Willemsse

21 January 2014

PHD study entitled: The affordances of mobile learning for an undergraduate nursing program: A design-based study.

I, hereby wish to grant you to conduct your study in the School of Nursing.

Please follow the ethical principles as outlined in your proposal.

Wish you the best for your studies.

A handwritten signature in blue ink, appearing to be "JK" or similar initials.

Prof Karien Jooste
Director
School of Nursing



ANNEXURE 5: PERMISSION LETTER - THE WESTERN CAPE DEPARTMENT OF HEALTH



UNIVERSITY OF THE WESTERN CAPE

Private Bag X 17, Bellville 7535, South Africa

Tel: +27 21-9592274, Fax: 27 21-9592271

The Minister of Health
 Department of Health
 Provincial Administration
 Western Cape Province
 8000



REQUESTING PERMISSION TO CONDUCT A RESEARCH STUDY AT A COMMUNITY HEALTH CENTRE

I hereby request to conduct a research study at Bellville South Community Health Centre and Parow Community Health Centre.

The study is entitled: *The affordances of m-learning for an undergraduate nursing programme: A design-based study.*

This study is part of the requirements for acquiring a PhD Degree in Nursing Science at a School of Nursing at the University of the Western Cape. The study will be done under the supervision and guidance of Professor K. Jooste of the School of Nursing, University of The Western Cape.

The research aim of this research study is to describe and explore the affordances of m-learning to integrate theory and practice of the examination of the head and neck within the primary health care module in an undergraduate nursing programme at a Higher Education Institution in the Western Cape

There may be a need for participants to take pictures with their mobile devices of visible conditions related to the examination of the head and neck. Every client identified with a visible condition of the head and neck will be approached for voluntary participation in the study and they will be assured that the pictures taken will only be used for publication in a peer reviewed and accredited educational journal. The researcher will adhere to the rights of client and participants to privacy and confidentiality.

The identity of all respondents will be protected as the researcher will allocate a number for each participant in the study and it will be used during focus groups and fieldnotes instead of their real name. The name of the Community Health Centre will not appear on the research report. All records will be kept for 5 years after publication of the results after which it will be destroyed. Information gathered in this study will not be available to any person, other than the researcher, research supervisors, independent coder and statistician.

The participants will not be coerced into participation and should they wish to withdraw at any time during the study, their wish will be respected. The researcher will ensure adherence to the highest standards of research planning, implementation and reporting.

This research has been approved by the Senate Research Committee and Ethics Committee of the University of the Western Cape.

If you have any questions about the research study itself, please contact:

Researcher: Juliana Willemse

University of the Western Cape; Private Bag X17, Bellville 7535; Telephone: (021) 959 2258; Cell: 084 619 2968; Email: jjwillemse@uwc.ac.za

Research Supervisor/Acting HOD School of Nursing: Prof K. Jooste

University of the Western Cape; Private Bag X17, Bellville 7535; Telephone: (021) 959 2271; Email: kjooste@uwc.ac.za

Dean of the Faculty of Community and Health Sciences: Prof Hester Klopper

University of the Western Cape; Private Bag X17; Email: hklopper@uwc.ac.za

ANNEXURE 6: PERMISSION TO CONDUCT THE STUDY AT THE WESTERN CAPE PROVINCE DEPARTMENT OF HEALTH CENTRES



STRATEGY & HEALTH SUPPORT
 Health, Research & Western Cape Gov.za
 5th Floor, Norton Rose House, 6, Kloof Street, Cape Town, 8001
 Tel: +27 21 483 6857; Fax: +27 21 483 9895
 www.cape.gov.za

REFERENCE: RP 1977/2013.
 ENQUIRIES: Ms Charlene Roderick

University of the Western Cape
 School of Nursing
 Private Bag X17
 Bellville
 7535

For attention: Juliano Willense

Re: The affordances of mobile learning for an undergraduate nursing program: A design-based study

Thank you for submitting your proposal to undertake the above-mentioned study. We are pleased to inform you that the department has granted you approval for your research. Please contact Mr A Potenda on 021 9718 1344 to assist you with any further enquiries in accessing the following sites:

**Bellville South CHC
 Parow CHC**

Kindly ensure that the following are adhered to:

1. Arrangements can be made with managers providing that normal activities of requested facilities are not interrupted.
2. Researchers, in accessing provincial health facilities, are expressing consent to provide the department with an electronic copy of the final report within six months of completion of research. This can be submitted to the provincial Research Co-ordinator (Health.Research@westerncape.gov.za)
3. The reference number above should be quoted in all future correspondence.

We look forward to hearing from you.

Yours sincerely

DAVID Naledi

DIRECTOR: HEALTH IMPACT ASSESSMENT
 DATE: 20/01/2014
 L BITALO

DIRECTOR: NORTHERN / TYGEBERG

ANNEXURE 7: PARTICIPANT INFORMATION SHEET



UNIVERSITY OF THE WESTERN CAPE

Private Bag X 17, Bellville 7535, South Africa

Tel: +27 21-9592274, Fax: 27 21-9592271

PARTICIPANT'S INFORMATION SHEET

Project Title: The affordances of m-learning for an undergraduate nursing programme: A design-based study

What is this study about?

I am Juliana Willemse, a registered PhD student in Nursing Science at the School of Nursing at the University of the Western Cape. I hereby invite you to participate in this research study because you are a registered student, lecturer or clinical facilitator involved in theory and practice of examination of the head and neck within the primary health care module. The purpose of this research study is to collate guidelines on the affordances of m-learning for an intervention to be integrated in the undergraduate nursing programme at a higher education institution in the Western Cape.

What will I be asked to do if I agree to participate?

You will be asked to participate in a m-learning activity and to share your experiences using an online reflection to inform the collation of guidelines for an intervention on the affordances of m-learning for an intervention to be integrated in the undergraduate nursing programme at a higher education institution in the Western Cape. You will sign permission to partake in each of the stages of the project on the consent form.

Would my participation in this study be kept confidential?

We will do our best to keep your personal information confidential. To help protect your confidentiality, all printed documents will be locked in a filing cabinet in the office of the researcher. The information will not be available to any person, other than the researcher, research supervisors, independent coder and statistician. Identification codes will be used instead of names on any of the data forms. All computer files related to this research study will be password-protected on the computer of the researcher. The online surveys, interviews and reflections will be anonymous and will not contain any information that will personally identify you.

What are the risks of this research?

There are no risks associated with participating in this research study.

What are the benefits of this research?

The research is not designed to personally benefit the researcher, but to inform guidelines for lectures on the affordances of m-learning for an intervention to be integrated in the undergraduate nursing programme at a higher education institution in the Western Cape. This can indirectly benefit future students to integrate theory and practice of the module content.

Do I have to be in this research and may I stop participating at any time?

Your participation in this research is completely voluntary. You may choose not to take part at all. If you decide to participate in this research, you may stop participating at any time. If you decide not to participate in this study or if you stop participating at any time, you will not be penalised or lose any benefits to which you otherwise qualify. If due to any circumstances you have to terminate your participation in this research study, any mobile device was handed to you as a participant in this project will have to be handed back to the researcher immediately.

This research study will involve making audio and video tapes of you during class sessions, focus groups and individual interviews. We will do our best to keep your personal information confidential. To help protect your confidentiality, all audio and videotapes will be kept on the computer of the researcher and one back-up set will be locked in a filing cabinet in the office of the researcher. The information will not be available to any person, other than the researcher, research supervisors, independent coder and statistician. All audio and videotapes related to this research study will be password-protected on the computer of the researcher. If we write a report or article about this research study, your identity will be protected to the maximum extent possible.

What if I have questions?

This research is being conducted by Juliana Willemse at the School of Nursing at the University of the Western Cape.

Should you have any questions regarding this study or wish to report any problems you may have experienced related to this study, please contact the researcher or research supervisor:

Researcher: Juliana Willemse

University of the Western Cape; Private Bag X17, Bellville 7535; Telephone: (021) 959 2258; Cell: 084 619 2968; Email: jjwillemse@uwc.ac.za

Research Supervisor/Acting HOD School of Nursing: Prof K. Jooste

University of the Western Cape; Private Bag X17, Bellville 7535; Telephone: (021) 959 2271; Email: kjooste@uwc.ac.za

Dean of the Faculty of Community and Health Sciences: Prof J Frantz

University of the Western Cape; Private Bag X17; Email: chs-deansoffice@uwc.ac.za

ANNEXURE 8: PARTICIPANT INFORMED CONSENT FORM

ELECTRONIC SURVEY



UNIVERSITY OF THE WESTERN CAPE

Private Bag X 17, Bellville 7535, South Africa

Tel: +27 21-9592274, Fax: 27 21-9592271

WRITTEN INFORMED CONSENT

Project Title: The affordances of m-learning for an undergraduate nursing programme: A design-based study

The study has been explained to me in a language that I understand and I hereby voluntarily agree to participate in the survey completion for this research study. All my questions have been answered and sufficiently clarified. I understand that my identity will not be disclosed and that I may withdraw from the study at any stage without giving any reason. I have been informed that the information gathered in this study will not be available to any person, other than the researcher, research supervisors, independent coder and statistician.

Participants name:

Participants signature:

Date:

Should you have any questions regarding this study or wish to report any problems you may have experienced related to this study, please contact the researcher or research supervisor:

Researcher: Juliana Willemse

University of the Western Cape; Private Bag X17, Bellville 7535; Telephone: (021) 959 2258; Cell: 084 619 2968; Email: jjwillemse@uwc.ac.za

Research Supervisor/Acting HOD School of Nursing: Prof K. Jooste

University of the Western Cape; Private Bag X17, Bellville 7535; Telephone: (021) 959 2271; Email: kjooste@uwc.ac.za

Dean of the Faculty of Community and Health Sciences: Prof J Frantz

University of the Western Cape; Private Bag X17; Email: chs-deansoffice@uwc.ac.za

ANNEXURE 9: PARTICIPANT INFORMED CONSENT FORM

FOCUS GROUP



UNIVERSITY OF THE WESTERN CAPE

Private Bag X 17, Bellville 7535, South Africa

Tel: +27 21-9592274, Fax: 27 21-9592271

WRITTEN INFORMED CONSENT

Project Title: The affordances of m-learning for an undergraduate nursing programme: A design-based study

The study has been explained to me in a language that I understand and I hereby voluntarily agree to participate in the focus groups in this research study. All my questions have been answered and sufficiently clarified. I understand that my identity will not be disclosed and that I may withdraw from the study at any stage without giving any reason. I have been informed that the information gathered in this study will not be available to any person, other than the researcher, research supervisors, independent coder and statistician.

Participants name: UNIVERSITY of the

Participants signature: WESTERN CAPE

Date:

Should you have any questions regarding this study or wish to report any problems you may have experienced related to this study, please contact the researcher or research supervisor:

Researcher: Juliana Willemse; University of the Western Cape; Private Bag X17, Bellville 7535; Telephone: (021) 959 2258; Cell: 084 619 2968; Email: jjwillemse@uwc.ac.za

Research Supervisor/Acting HOD School of Nursing: Prof K. Jooste

University of the Western Cape; Private Bag X17, Bellville 7535; Telephone: (021) 959 2271; Email: kjooste@uwc.ac.za

Dean of the Faculty of Community and Health Sciences: Prof J Frantz

University of the Western Cape; Private Bag X17; Email: chs-deansoffice@uwc.ac.za

ANNEXURE 10: FOCUS GROUP CONFIDENTIALITY BINDING FORM



UNIVERSITY OF THE WESTERN CAPE

Private Bag X 17, Bellville 7535, South Africa

Tel: +27 21-9592274, Fax: 27 21-9592271

FOCUS GROUP CONFIDENTIALITY BINDING FORM

Project Title: The affordances of m-learning for an undergraduate nursing programme: A design-based study

The study has been described to me in language that I understand and I freely and voluntarily agree to participate. My questions about the study have been answered. I understand that my identity will not be disclosed and that I may withdraw from the study without giving a reason at any time and this will not negatively affect me in any way. I agree to be audio-taped during my participation in the study. I also agree not to disclose any information that was discussed during the group discussion.

Participant's name.....

Participant's signature.....

Witness's name.....

Witness's signature.....

Date.....

Should you have any questions regarding this study or wish to report any problems you may have experienced related to this study, please contact the researcher or research supervisor:

Researcher: Juliana Willemse: University of the Western Cape; Private Bag X17, Bellville 7535; Telephone: (021) 959 2258; Cell: 084 619 2968; Email: jjwillemse@uwc.ac.za

Research Supervisor/Acting HOD School of Nursing: Prof K. Jooste: University of the Western Cape; Private Bag X17, Bellville 7535; Telephone: (021) 959 2271; Email: kjooste@uwc.ac.za

Dean of the Faculty of Community and Health Sciences: Prof J Frantz

University of the Western Cape; Private Bag X17; Email: chs-deansoffice@uwc.ac.za

ANNEXURE 11: INDIVIDUAL INTERVIEW CONSENT FORM



UNIVERSITY OF THE WESTERN CAPE

Private Bag X 17, Bellville 7535, South Africa

Tel: +27 21-9592274, Fax: 27 21-9592271

WRITTEN INFORMED CONSENT

Project Title: The affordances of m-learning for an undergraduate nursing programme: A design-based study

The study has been explained to me in a language that I understand and I hereby voluntarily agree to participate in the individual interview for this research study. All my questions have been answered and sufficiently clarified. I understand that my identity will not be disclosed and that I may withdraw from the study at any stage without giving any reason. I have been informed that the information gathered in this study will not be available to any person, other than the researcher, research supervisors, independent coder and statistician.

Participants name:

Participants signature:

Date:

Should you have any questions regarding this study or wish to report any problems you may have experienced related to this study, please contact the researcher or research supervisor:

Researcher: Juliana Willemse: University of the Western Cape; Private Bag X17, Bellville 7535; Telephone: (021) 959 2258; Cell: 084 619 2968; Email: jjwillemse@uwc.ac.za

Research Supervisor/Acting HOD School of Nursing: Prof K. Jooste: University of the Western Cape; Private Bag X17, Bellville 7535; Telephone: (021) 959 2271; Email: kjooste@uwc.ac.za

Dean of the Faculty of Community and Health Sciences: Prof J Frantz

University of the Western Cape; Private Bag X17; Email: chs-deansoffice@uwc.ac.za

ANNEXURE 12: INDIVIDUAL INTERVIEW SCHEDULE



UNIVERSITY OF THE WESTERN CAPE

Private Bag X 17, Bellville 7535, South Africa

Tel: +27 21-9592274, Fax: 27 21-9592271

INDIVIDUAL INTERVIEW SCHEDULE

QUESTIONS TO GUIDE INTERVIEWS

The following questions that guides may be posed as probing questions during the individual interviews:

How can mobile devices be used to integrate theory and practice of the examination of the head and neck within the primary health care module in an undergraduate nursing programme?

What are the important characteristics of mobile devices that can make them effective to integrate the teaching and learning of the examination of the head and neck within the primary health care module in an undergraduate nursing programme?

How can the use of mobile devices be introduced into the curriculum to integrate the teaching and learning of the examination of the head and neck within the primary health care module in an undergraduate nursing programme?

ANNEXURE 13: PATIENT CONSENT FORM**UNIVERSITY OF THE WESTERN CAPE**

Private Bag X 17, Bellville 7535, South Africa

Tel: +27 21-9592274, Fax: 27 21-9592271

WRITTEN INFORMED CONSENT**Project Title: The affordances of m-learning for an undergraduate nursing programme: A design-based study**

The study has been explained to me in a language that I understand and I hereby voluntarily agree to allow participants in this study to take a photograph or make a video recording with their mobile device of an external condition presented of my ears, nose and throat.

All my questions have been answered and sufficiently clarified. I understand that my identity will not be disclosed and that I may withdraw from the study at any stage without giving any reason. Informed gathered in this study will not be available to any person, other than the researcher, research supervisors, independent coder and statistician.

Patient/Clients name:

Patient/Clients signature:

Date:

Should you have any questions regarding this study or wish to report any problems you may have experienced related to this study, please contact the researcher or research supervisor:

Researcher: Juliana Willemse: University of the Western Cape; Private Bag X17, Bellville 7535; Telephone: (021) 959 2258; Cell: 084 619 2968; Email: jjwillemse@uwc.ac.za

Research Supervisor/Acting HOD School of Nursing: Prof K. Jooste: University of the Western Cape; Private Bag X17, Bellville 7535; Telephone: (021) 959 2271; Email: kjooste@uwc.ac.za

Dean of the Faculty of Community and Health Sciences: Prof J Frantz

University of the Western Cape; Private Bag X17; Email: chs-deansoffice@uwc.ac.za

ANNEXURE 14: STUDENT SURVEY

12/7/2017

Student Survey_10 May 2013

Student Survey_10 May 2013

A University

Private Bag

Western Cape Province

South Africa

Survey for Semester Two 2013 Community Health Nursing Students

Project Title: The affordances of mobile learning for an undergraduate nursing program: A design-based study.

Mobile learning is "learning with mobile devices" and has the potential to offer something innovative and distinctive to extend the modes of learning. Mobile devices are associated with smart-phones, netbooks, hand held computers, gaming consoles and media players (Traxler, 2011:4).

The question being posed by this project is "What is the extent of the knowledge of students, lecturers and clinical facilitators about the uses and value of mobile devices and their skill in using them?"

This survey will explore the extent to which mobile technology can be used to enhance the teaching of and learning about the integration of theory and practice of the ENT health assessment in the primary care and clinical skills module offered at a higher education institution.

Your completion of this survey will inform the understanding of researchers and nursing practitioners in terms of how to integrate mobile technology with lecture room teaching and learning of this module.

For the purpose of this study, "off campus" means, in terms of being able to access the internet, anywhere other than on the physical premises of the university.

Please answer the questions by selecting the most appropriate box(es).

Questions marked with an * is compulsory.

*Required

Section A**Biographical Information****1. 1. Please indicate whether you are a male or female respondent. ***

Tick all that apply.

- Female
- Male

12/7/2017

Student Survey_10 May 2013

2. Please indicate the age category in which you can be classified. *

Mark only one oval.

- <21 years
- 21-25 years
- 26-30 years
- 31-35 years
- 36-40 years
- 41-45 years
- 46-50 years
- >50 years

Section B

Being Mobile ("Mobileness")

3. When did you first start using a mobile device? *

Tick all that apply.

- 6 months ago or less
- One year
- Two to three years
- More than three years



4. How did you originally learn to use your mobile device? *

Tick the most appropriate box.

Tick all that apply.

- Learned as I went along
- Learned from friends
- Learned from family
- Learned from colleagues/students on campus
- Learned from the consultant of the mobile device provider
- Other: _____

UNIVERSITY of the
WESTERN CAPE

5. Where or from whom do you seek help when you experience any problems with your mobile device? *

Tick the most appropriate box.

Tick all that apply.

- Solve the problem on my own
- Ask friends
- Ask family
- Ask colleagues/students on campus
- Refer to the manual of the mobile device
- Ask the consultant of the mobile device provider
- Searched online

12/7/2017

Student Survey, 10 May 2013

6. 6. Indicate the type of mobile device(s) that you currently use. *

You may tick more than one box.

Tick all that apply.

- Basic mobile phone (voice, short messaging service (sms), limited or no internet access)
- Smartphone
- e-reader
- Non-phone device (iPod touch, smart watches, personal digital assistants (PDA), portable game console, etc.)
- small/mini tablet
- Full size tablet
- Laptop
- Other: _____

7. 7. Indicate the period during which you use your mobile device most. *

Tick all that apply.

- Before 06H00 in the morning
- Between 06H00 – 10H00
- Between 10H00 – 12H00
- Between 12H00 – 14H00
- Between 14H00 – 16H00
- After 16H00
- On weekends only
- Any available time
- Other: _____



UNIVERSITY of the
WESTERN CAPE

Section C**Internet Connectivity****8. 8. Are you able to connect to the internet off campus? ***

Tick all that apply.

- Yes
- No

9. 9. If yes, what type of connection do you use most often? *

Tick all that apply.

- Dial up
- Broadband (ADSL/Wireless)
- Cell phone (3G)
- Satellite
- Don't Know

12/7/2017

Student Survey_10 May 2013

10. I will be able to use my mobile device to access library databases off campus, e.g. EBSCO, ERIC, PubMed, etc. in order to do my own research on the examination of the head and neck within the Primary Health Care Module. *

Indicate to what extent you agree with the statement. Refer to the Likert Scale ratings below to answer. NEVER HARDLY EVER SOMETIMES DO FREQUENTLY ALWAYS 1 2 3 4 5
Mark only one oval.

1 2 3 4 5

Never Always

11. I will be prepared to use my mobile device, e.g. smartphone, notebook, laptop, etc. to help with the integration of theory and practice in the course of the examination of the head and neck within the Primary Health Care Module off campus? *

Indicate to what extent you agree with the statement. Refer to the Likert Scale ratings below to answer. NEVER HARDLY EVER SOMETIMES DO FREQUENTLY ALWAYS 1 2 3 4 5
Mark only one oval.

1 2 3 4 5

Never Always

12. I make use of the following mobile applications. *

Select the boxes which indicate the applications that you use most frequently.
Tick all that apply.

- Facebook
 Twitter
 A Blog, e.g. Blogger, Wordpress, etc.
 Flickr
 Whatsapp
 Mixit
 BBM - Blackberry Messenger
 Other: _____



UNIVERSITY of the
WESTERN CAPE

13. I am interested in using the following mobile applications to review tasks received from lecturers and clinical facilitators that are related to my coursework. *

Select at least TWO applications that you are or would be most comfortable using.
Tick all that apply.

- Mixit
 Whatsapp
 BBM - Blackberry Messenger
 Email, e.g. Gmail, Hotmail, Yahoo, etc.
 Facebook
 Twitter
 A Blog, e.g. Blogger, Wordpress, etc.
 Flickr
 Other: _____

Section D

12/7/2017

Student Survey_10 May 2013

24. 24. I am willing to engage with mobile devices to help me with the integration of theory and practice of the examination of the head and neck within the Primary Health Care Module. *

Mark only one oval.

	1	2	3	4	5	
Never	<input type="radio"/>	Always				

Powered by
 Google Forms



UNIVERSITY *of the*
WESTERN CAPE

ANNEXURE 15: STUDENT SURVEY RESULTS

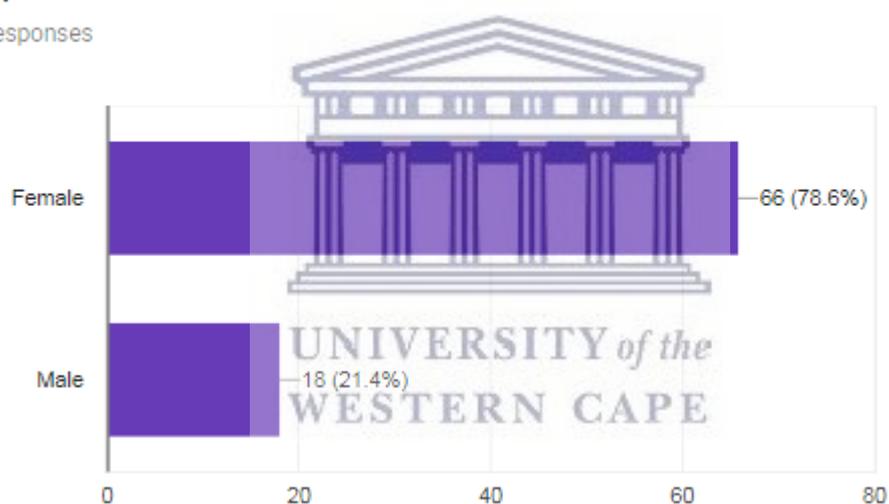
Student Survey_10 May 2013

84 responses

[Publish analytics](#)**Section A**

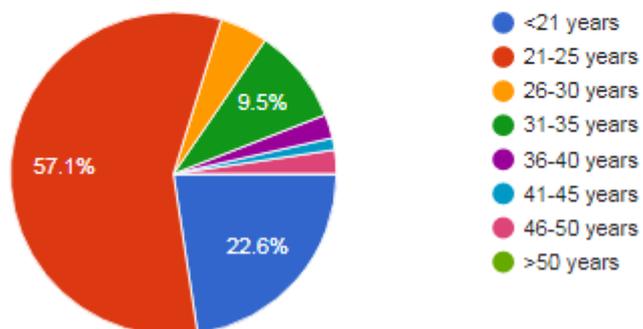
1. Please indicate whether you are a male or female respondent.

84 responses



2. Please indicate the age category in which you can be classified.

84 responses

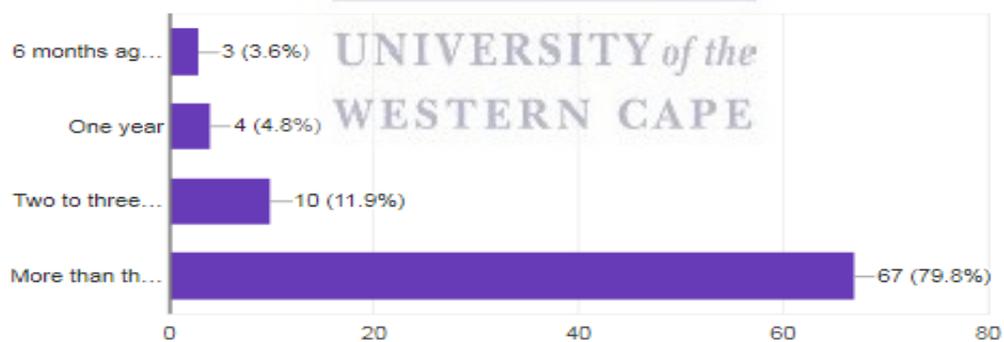


Section B



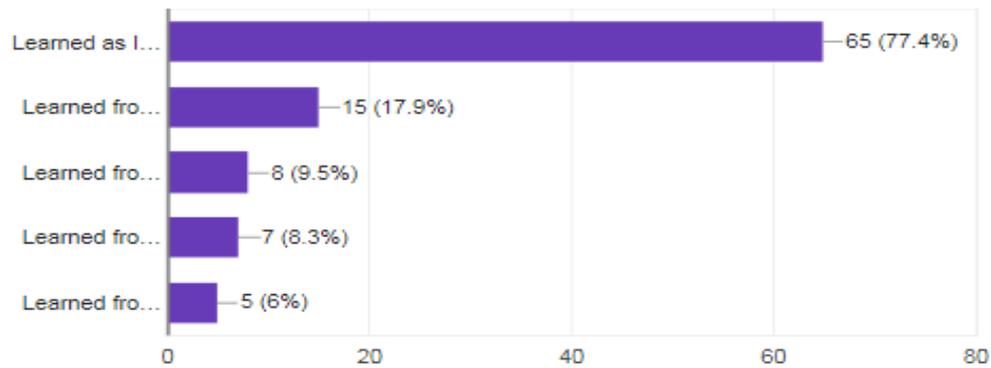
3. When did you first start using a mobile device?

84 responses



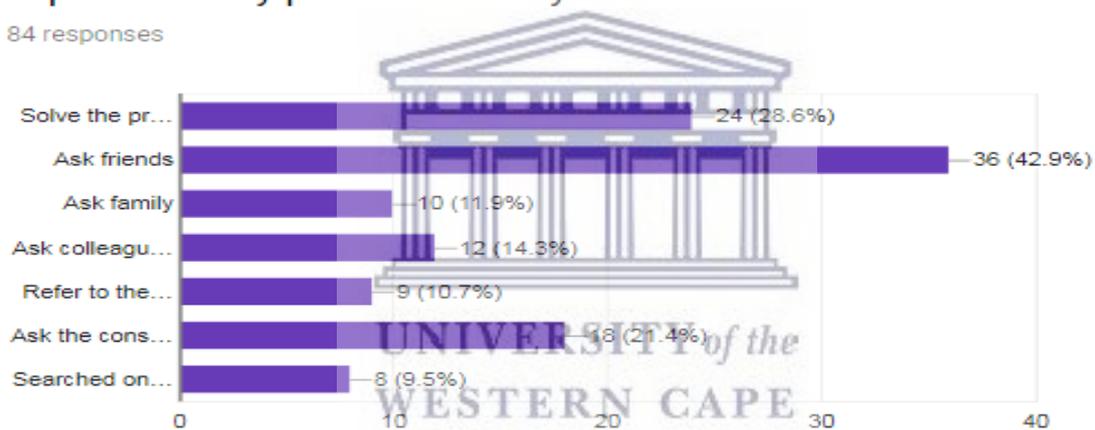
4. How did you originally learn to use your mobile device?

84 responses



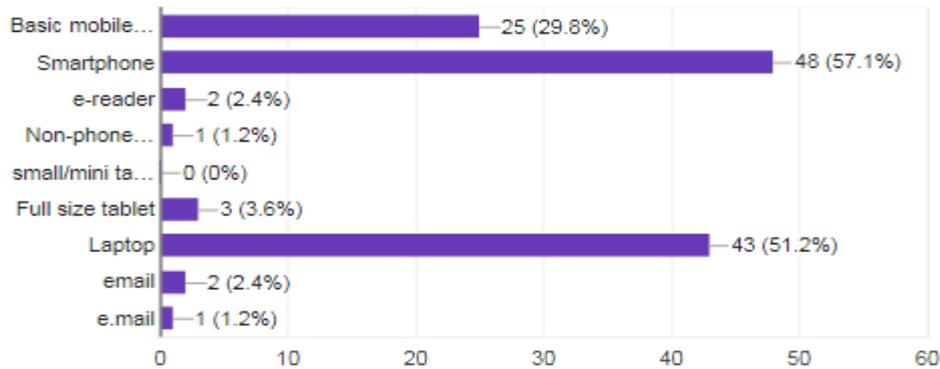
5. Where or from whom do you seek help when you experience any problems with your mobile device?

84 responses



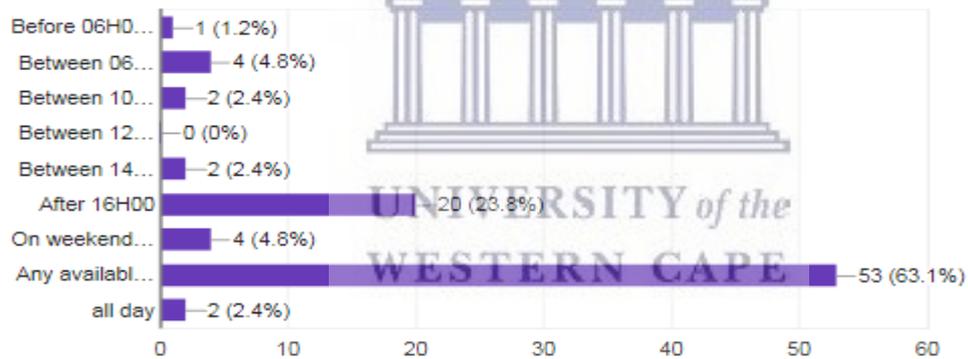
6. Indicate the type of mobile device(s) that you currently use.

84 responses



7. Indicate the period during which you use your mobile device most.

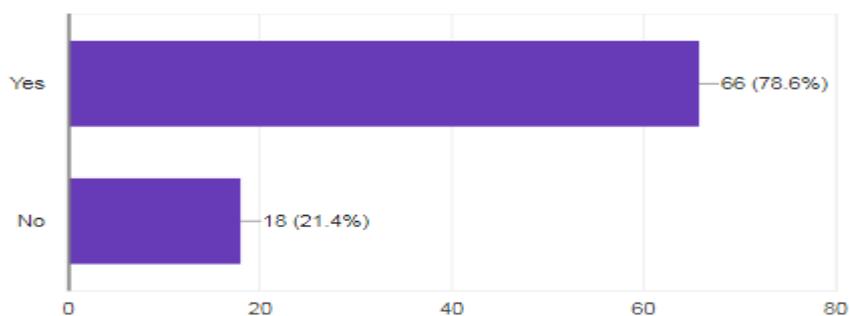
84 responses



Section C

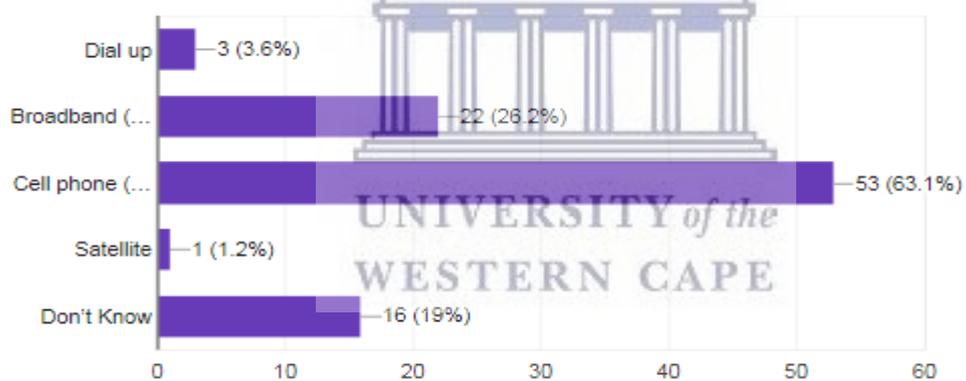
8. Are you able to connect to the internet off campus?

84 responses



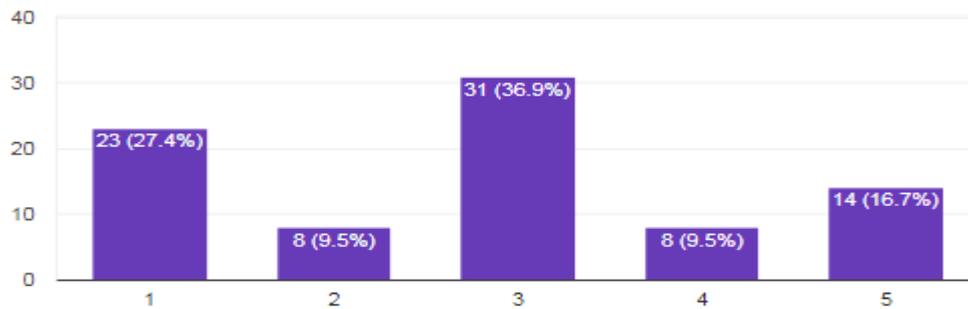
9. If yes, what type of connection do you use most often?

84 responses



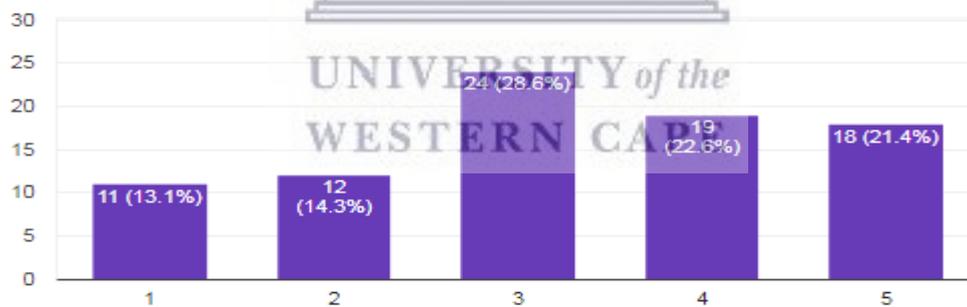
10. I will be able to use my mobile device to access library databases off campus, e.g. EBSCO, ERIC, PubMed, etc. in order to do my own research on the examination of the head and neck within the Primary Health Care Module.

84 responses



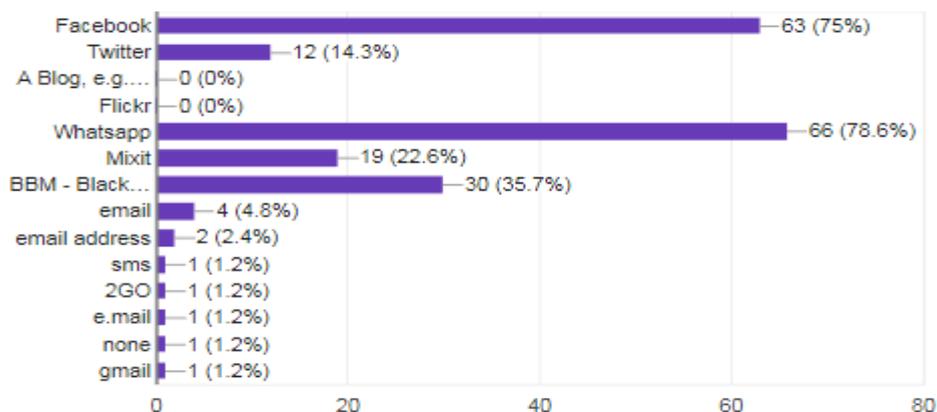
11. I will be prepared to use my mobile device, e.g. smartphone, notebook, laptop, etc. to help with the integration of theory and practice in the course of the examination of the head and neck within the Primary Health Care Module off campus?

84 responses



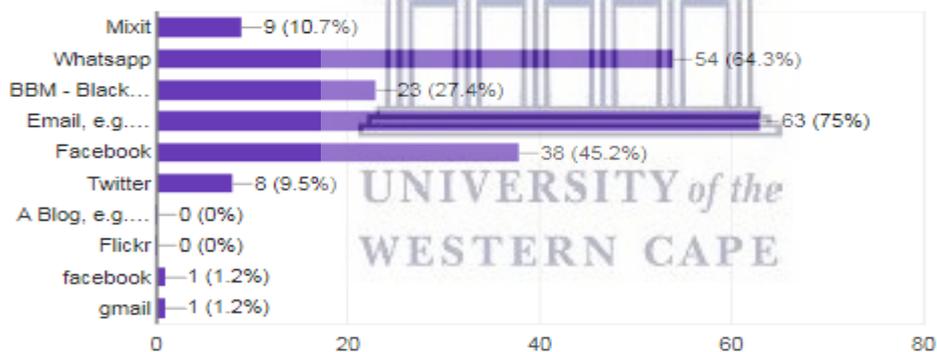
12. I make use of the following mobile applications.

84 responses



13. I am interested in using the following mobile applications to review tasks received from lecturers and clinical facilitators that are related to my coursework.

84 responses

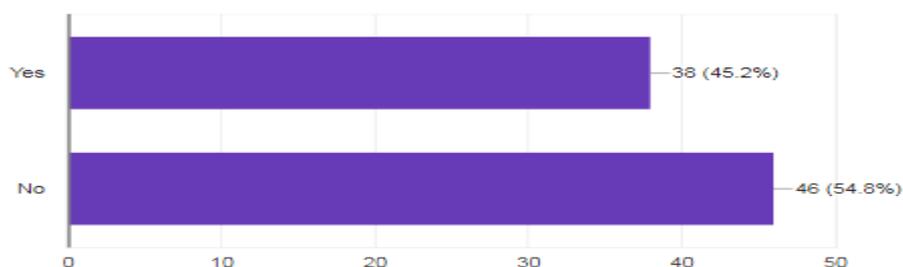


UNIVERSITY of the
WESTERN CAPE

Section D

14. Do you ever use your mobile device to communicate with your lecturers and clinical facilitators to help you with the integration of theory and clinical practice, e.g. while in the clinical field doing clinical work?

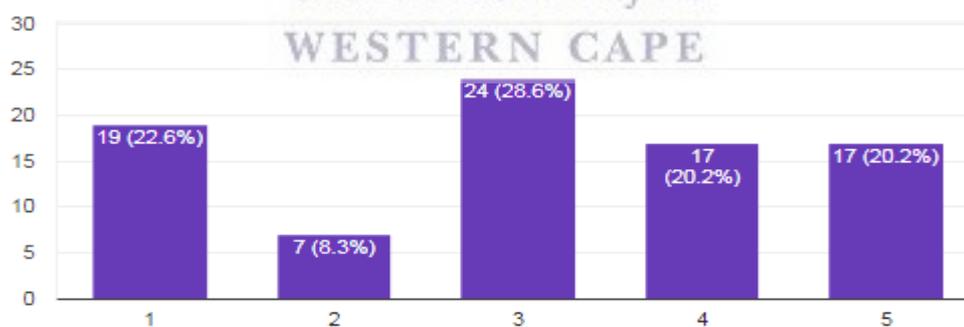
84 responses



In the following questions, indicate, on a scale of 1 – 5, your degree of preference for each method of communication with your lecturer or clinical facilitator. The value range is from 1 (Never) to 5 (Always):

15. Offline Chats (e.g. SMS)

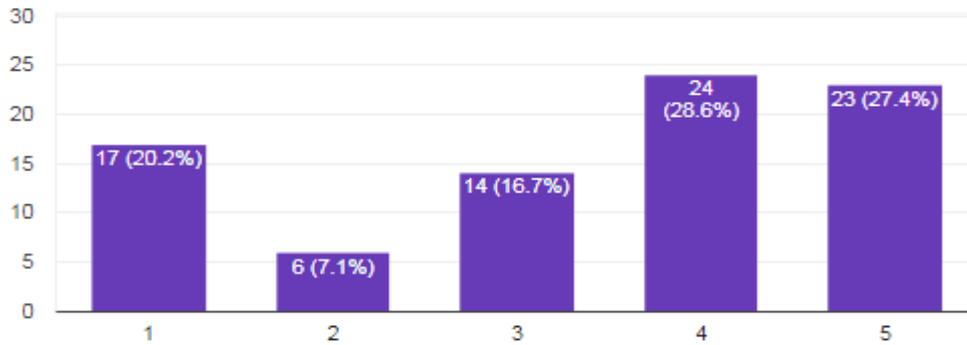
84 responses



UNIVERSITY of the
WESTERN CAPE

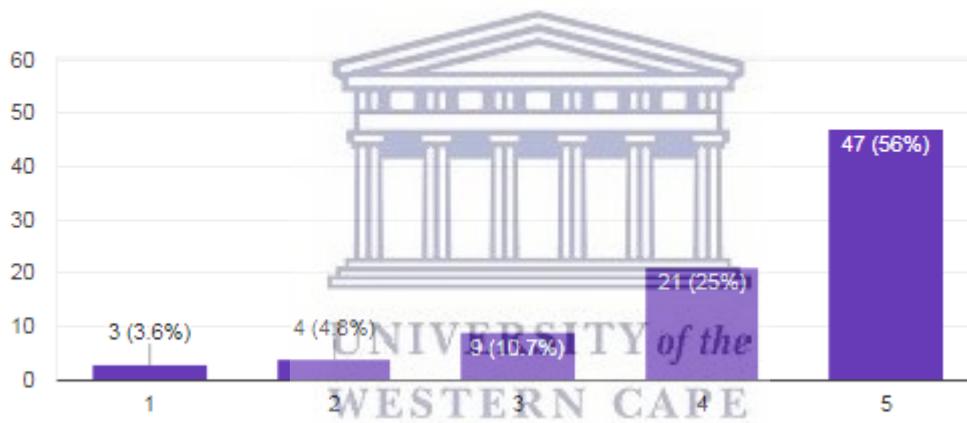
16. Online Chats (e.g. Mixit, Whatsapp, Skype)

84 responses



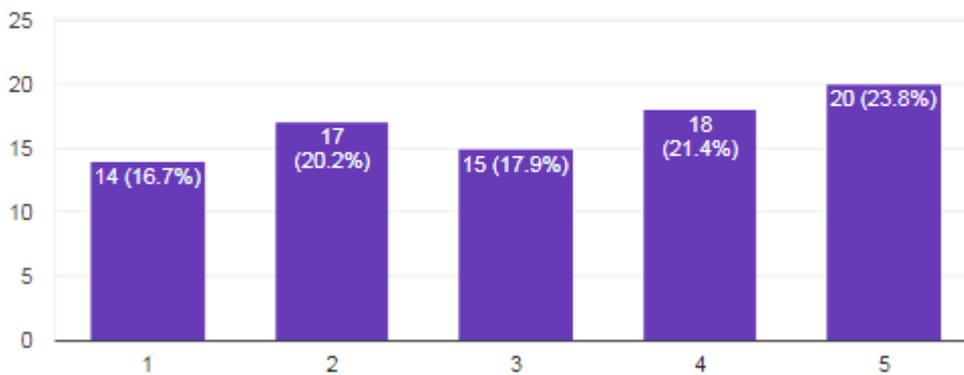
17. Email

84 responses



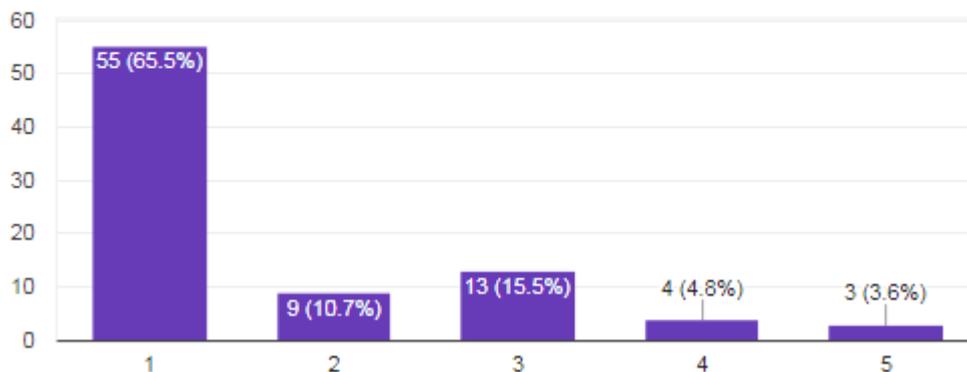
18. Online network community (e.g. Facebook)

84 responses



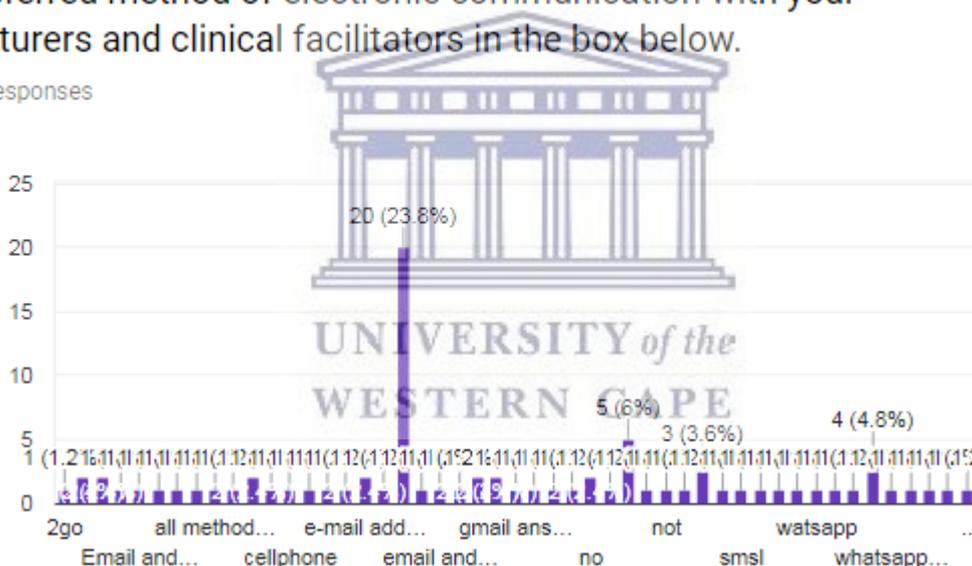
19. Blogging

84 responses



20. If it has been omitted in this section, indicate your preferred method of electronic communication with your lecturers and clinical facilitators in the box below.

84 responses



21. In your opinion, can mobile devices be used by students, lecturers and clinical facilitators to enhance the integration of theory and clinical practice of the ENT health assessment in the primary care and clinical skills module?

84 responses

yes (27)

I would say yes, as is easy to read on the run. meaning it will be easy for you to study where ever you are (2)

yes it can (2)

yes because that will make communication far much easier!! (2)

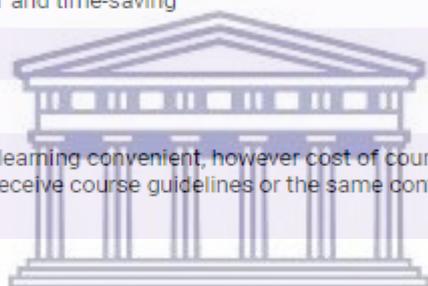
for those who have access to any of the above mentioned devices i would say it would be very helpful especially off campus communication. i believe with our busy schedules it would making teaching and learning a lot easier and enjoyable and if you certain your device will not let you down most tasks would be done on time.

Yes! It makes everything easier and time-saving

Yes its easier and faster

yes. its easier

Yes, mobile devices will make learning convenient, however cost of courses should be adjusted as we will no longer receive course guidelines or the same contact with lectures?

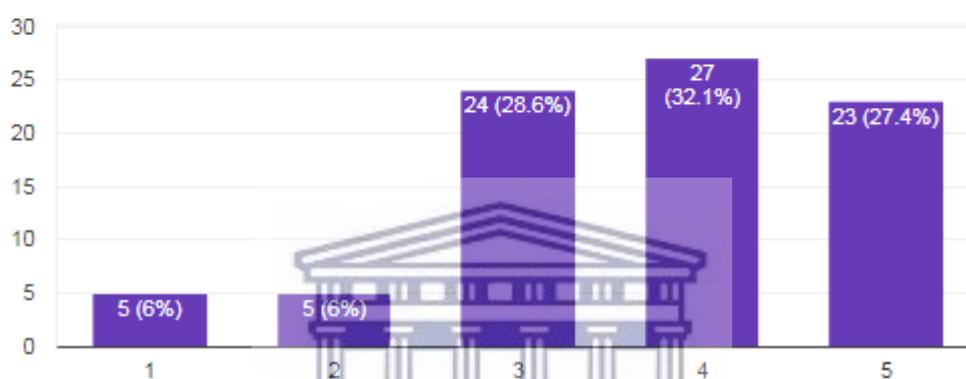


UNIVERSITY *of the*
WESTERN CAPE

Indicate to what degree the following apply in your learning context:

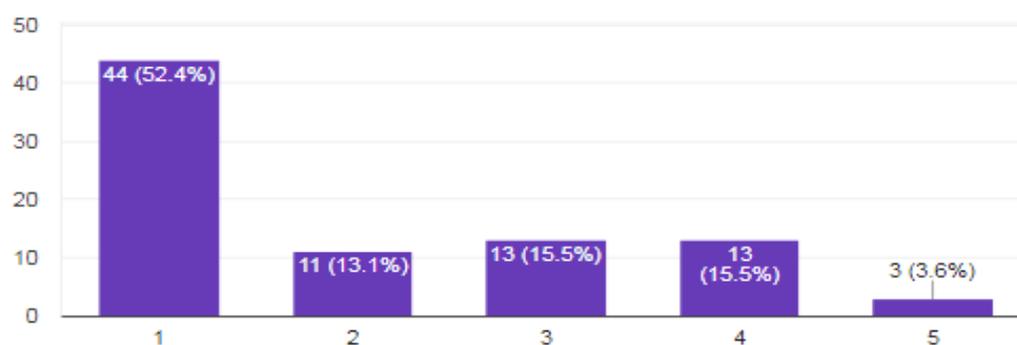
22. I am able to access content to from the internet that is relevant to the course content by means of my mobile device.

84 responses



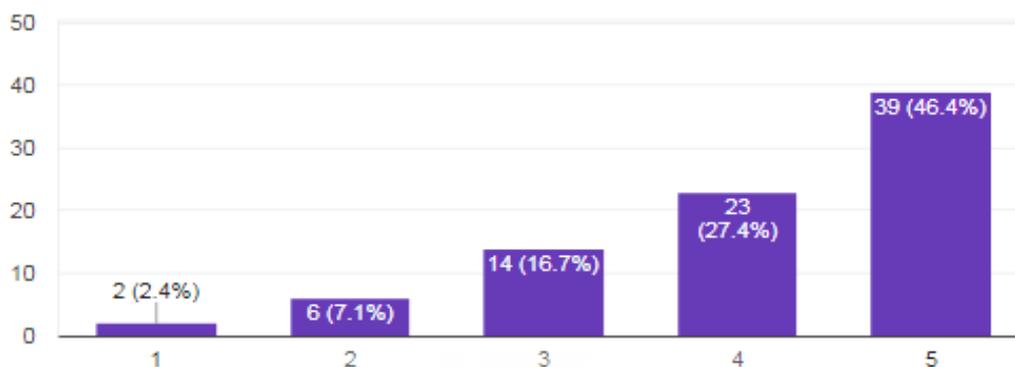
23. I currently use my mobile device to chat with my lecturers and clinical facilitators via Whatsapp, Mixit, Facebook, etc. for academic support.

84 responses

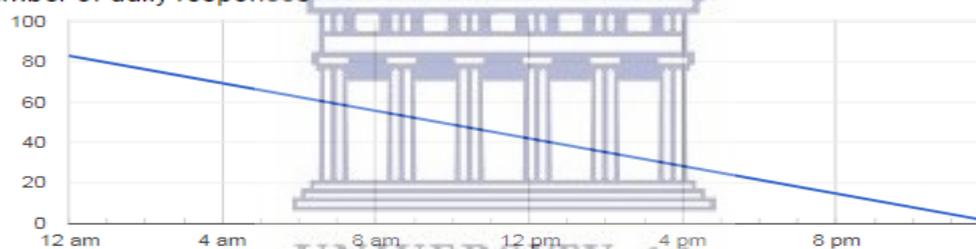


24. I am willing to engage with mobile devices to help me with the integration of theory and practice of the examination of the head and neck within the Primary Health Care Module.

84 responses



Number of daily responses



UNIVERSITY of the
WESTERN CAPE

This content is neither created nor endorsed by Google. Report Abuse - Terms of Service - Additional Terms

Google Forms

ANNEXURE 16: SURVEY OF LECTURERS AND CLINICAL FACILITATORS

12/7/2017

Lecturers & Clinical Facilitator Survey_12 April 2013

Lecturers & Clinical Facilitator Survey_12 April 2013

A University

Private Bag

Western Cape Province

South Africa

Survey for Community Health Lecturers & Clinical Facilitators

Project Title: The affordances of mobile learning for an undergraduate nursing program: A design-based study.

Mobile learning is "learning with mobile devices" and has the potential to offer something innovative and distinctive to extend the modes of learning. Mobile devices are associated with smart-phones, netbooks, hand held computers, gaming consoles and media players (Traxler, 2011:4).

The question being posed by this project is "What is the extent of the knowledge of students, lecturers and clinical facilitators about the uses and value of mobile devices and their skill in using them?"

This survey will explore the extent to which mobile technology can be used to enhance the teaching of and learning about the integration of theory and practice of the ENT health assessment in the primary care and clinical skills module offered at a higher education institution.

Your completion of this survey will inform the understanding of researchers and nursing practitioners in terms of how to integrate mobile technology with lecture room teaching and learning of this module.

For the purpose of this study, "off campus" means, in terms of being able to access the internet, anywhere other than on the physical premises of the university.

Please answer the questions by selecting the most appropriate box(es).

Questions marked with an * is compulsory.

*Required

Section A

Biographical information

1. 1. Please indicate whether you are a male or female respondent. *

Tick all that apply.

Female

Male

12/7/2017

Lecturers & Clinical Facilitator Survey_12 April 2013

2. 2. Please indicate the age category in which you can be classified. *

Mark only one oval.

- <21 years
- 21-25 years
- 26-30 years
- 31-35 years
- 36-40 years
- 41-45 years
- 46-50 years
- >50 years

Section B

Being Mobile ("Mobileness")

3. 3. When did you first start using a mobile device? *

Tick all that apply.

- 6 months ago or less
- One year
- Two to three years
- More than three years



4. 4. How did you originally learn to use your mobile device? *

*Tick the most appropriate box.**Tick all that apply.*

- Learned as I went along
- Learned from friends
- Learned from family
- Learned from colleagues/students on campus
- Learned from the consultant of the mobile device provider
- Other: _____

UNIVERSITY of the
WESTERN CAPE

5. 5. Where or from whom do you seek help when you experience any problems with your mobile device? *

*Tick the most appropriate box.**Tick all that apply.*

- Solve the problem on my own
- Ask friends
- Ask family
- Ask colleagues/students on campus
- Refer to the manual of the mobile device
- Ask the consultant of the mobile device provider
- Searched online

12/7/2017

Lecturers & Clinical Facilitator Survey_12 April 2013

6. 6. Indicate the type of mobile device(s) that you currently use. *

You may tick more than one box.
Tick all that apply.

- Basic mobile phone (voice, short messaging service (sms), limited or no internet access)
- Smartphone
- e-reader
- Non-phone device (iPod touch, smart watches, personal digital assistants (PDA), portable game console, etc.)
- small/mini tablet
- Full size tablet
- Laptop
- Other: _____

7. 7. Indicate the period during which you use your mobile device most. *

Tick all that apply.

- Before 06H00 in the morning
- Between 06H00 – 10H00
- Between 10H00 – 12H00
- Between 12H00 – 14H00
- Between 14H00 – 16H00
- After 16H00
- On weekends only
- Any available time
- Other: _____

**Section C**

UNIVERSITY of the
WESTERN CAPE

Internet Connectivity**8. 8. Are you able to connect to the internet off campus? ***

Tick all that apply.

- Yes
- No

9. 9. If yes, what type of connection do you use most often? *

Tick all that apply.

- Dial up
- Broadband (ADSL/Wireless)
- Cell phone (3G)
- Satellite
- Don't Know

12/7/2017

Lecturers & Clinical Facilitator Survey_12 April 2013

10. 10. I use my mobile device, e.g. smartphone, notebook, laptop, etc. to help students with the integration of theory and practice of the ENT health assessment in the primary care and clinical skills module off campus. *

Indicate to what extent you agree with the statement. Refer to the Likert Scale ratings below to answer. NEVER HARDLY EVER SOMETIMES DO FREQUENTLY ALWAYS 1 2 3 4 5

Mark only one oval.

1 2 3 4 5

Never Always

11. 11. I am able to use my mobile device to access library databases off campus, e.g. EBSCO, ERIC, PubMed, etc. in order to do my own research on the ENT health assessment in the primary care and clinical skills module. *

Indicate to what extent you agree with the statement. Refer to the Likert Scale ratings below to answer. NEVER HARDLY EVER SOMETIMES DO FREQUENTLY ALWAYS 1 2 3 4 5

Mark only one oval.

1 2 3 4 5

Never Always

12. 12. Are you prepared to use your mobile device, e.g. smartphone, notebook, laptop, etc. to help students with the integration of theory and practice of the ENT health assessment of the primary care and clinical skills module off campus? *

Indicate to what extent you agree with the statement. Refer to the Likert Scale ratings below to answer. NEVER HARDLY EVER SOMETIMES DO FREQUENTLY ALWAYS 1 2 3 4 5

Mark only one oval.

1 2 3 4 5

Never Always

13. 13. I make use of the following mobile applications. *

Select the boxes which indicate the applications that you use most frequently. Tick all that apply.

- Facebook
- Twitter
- A Blog, e.g. Bliggger, Wordpress, etc.
- Flickr
- Whatsapp
- Mixit
- BBM - Blackberry Messenger
- Other: _____

12/7/2017

Lecturers & Clinical Facilitator Survey_12 April 2013

18. 18. Email **Mark only one oval.*

	1	2	3	4	5	
Never	<input type="radio"/>	Always				

19. 19. Online network community (e.g. Facebook) **Mark only one oval.*

	1	2	3	4	5	
Never	<input type="radio"/>	Always				

20. 20. Blogging **Mark only one oval.*

	1	2	3	4	5	
Never	<input type="radio"/>	Always				

21. 21. If it has been omitted in this section, indicate your preferred method of electronic communication with your students in the box below. *

22. 22. In your opinion, can mobile devices be used by both students and lecturers to enhance the integration of theory and clinical practice of the ENT health assessment in the primary care and clinical skills module? *

Indicate to what degree the following apply in your teaching context:**23. 23. I am able to find and distribute content to students from the internet that is relevant to the course content by means of my mobile device. Indicate to what extent you agree with the statement. Refer to the Likert Scale ratings below to answer. NEVER - 1 HARDLY EVER - 2 SOMETIMES DO - 3 FREQUENTLY - 4 ALWAYS - 5 ****Mark only one oval.*

	1	2	3	4	5	
Never	<input type="radio"/>	Always				

12/7/2017

Lecturers & Clinical Facilitator Survey_12 April 2013

24. 24. I am able to use my mobile device to develop my own content in an online learning environment for students to use. *

Indicate to what extent you agree with the statement. Refer to the Likert Scale ratings below to answer. NEVER - 1 HARDLY EVER - 2 SOMETIMES DO - 3 FREQUENTLY - 4 ALWAYS - 5
Mark only one oval.

	1	2	3	4	5	
Never	<input type="radio"/>	Always				

25. 25. I currently use my mobile device in my teaching to communicate course information to students, e.g. changes in classes, assignment deadlines, etc. Indicate to what extent you agree with the statement. Refer to the Likert Scale ratings below to answer. NEVER - 1 HARDLY EVER - 2 SOMETIMES DO - 3 FREQUENTLY - 4 ALWAYS - 5 *

Mark only one oval.

	1	2	3	4	5	
Never	<input type="radio"/>	Always				

26. 26. I currently use my mobile device to review course related pictures and videos made by students. Indicate to what extent you agree with the statement. Refer to the Likert Scale ratings below to answer. NEVER - 1 HARDLY EVER - 2 SOMETIMES DO - 3 FREQUENTLY - 4 ALWAYS - 5 *

Mark only one oval.

	1	2	3	4	5	
Never	<input type="radio"/>	Always				

27. 27. I currently use my mobile device to chat with students via Whatsapp, Mixit, Facebook, etc. to offer them academic support. Indicate to what extent you agree with the statement. Refer to the Likert Scale ratings below to answer. NEVER - 1 HARDLY EVER - 2 SOMETIMES DO - 3 FREQUENTLY - 4 ALWAYS - 5 *

Mark only one oval.

	1	2	3	4	5	
Never	<input type="radio"/>	Always				

28. 28. I am willing to engage with mobile devices to help students with the integration of theory and clinical practice of the ENT health assessment in the primary care and clinical skills module. Indicate to what extent you agree with the statement. Refer to the Likert Scale ratings below to answer. NEVER - 1 HARDLY EVER - 2 SOMETIMES DO - 3 FREQUENTLY - 4 ALWAYS - 5 *

Mark only one oval.

	1	2	3	4	5	
Never	<input type="radio"/>	Always				

Powered by
 Google Forms

https://docs.google.com/forms/d/1M_dlpA9gq4H0RovVQajYchurR2ilvxl_A8Z8y8Bvd8

7/7

ANNEXURE 17: SURVEY RESULTS: LECTURERS AND CLINICAL FACILITATORS

Lecturers & Clinical Facilitator Survey_12 April 2013

6 responses

Section A

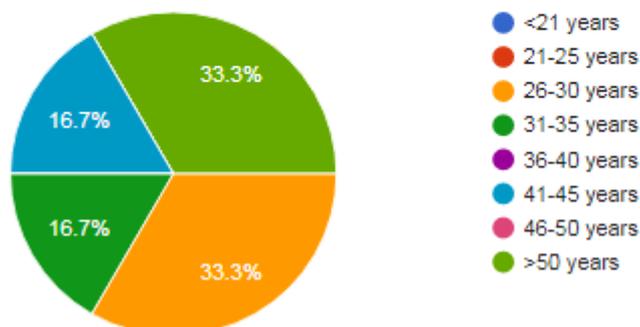
1. Please indicate whether you are a male or female respondent.

6 responses



2. Please indicate the age category in which you can be classified.

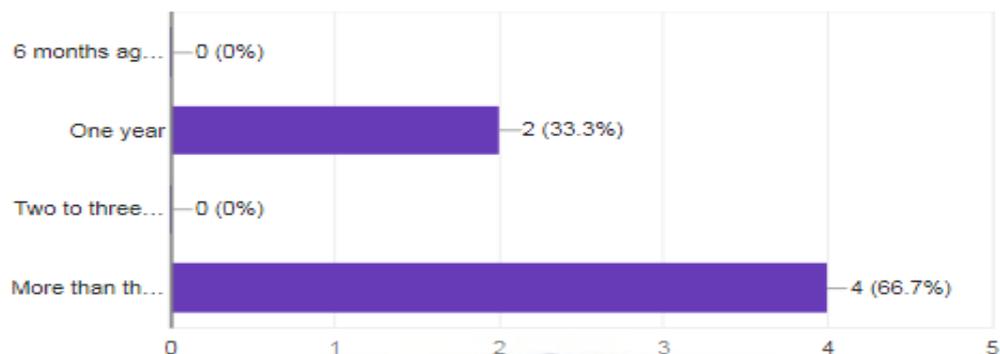
6 responses



Section B

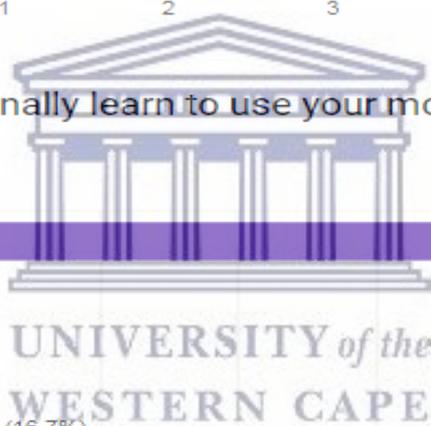
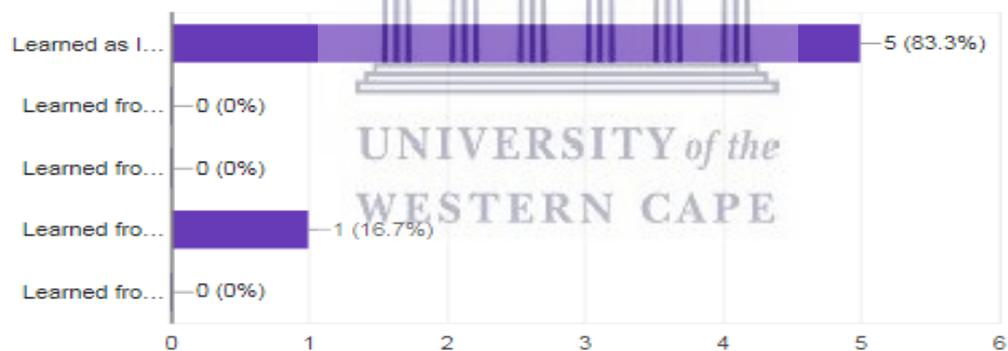
3. When did you first start using a mobile device?

6 responses



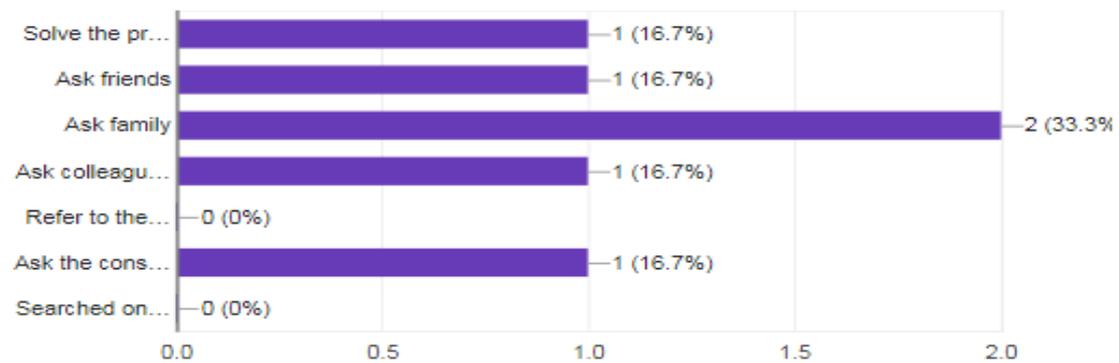
4. How did you originally learn to use your mobile device?

6 responses



5. Where or from whom do you seek help when you experience any problems with your mobile device?

6 responses



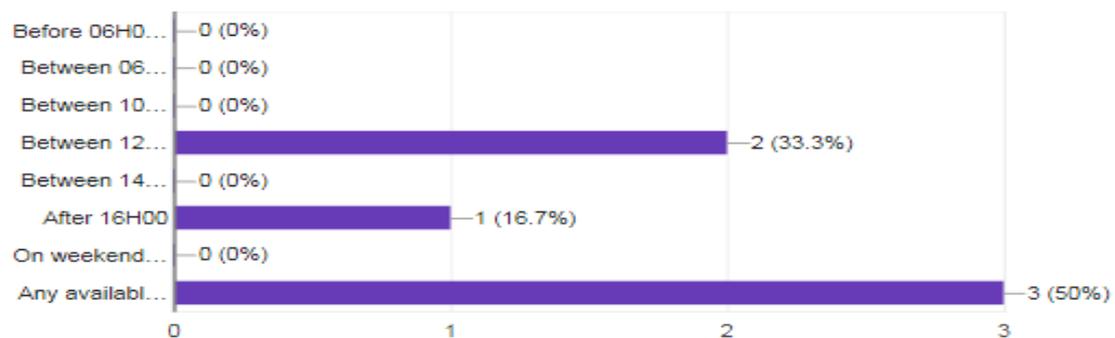
6. Indicate the type of mobile device(s) that you currently use.

6 responses



7. Indicate the period during which you use your mobile device most.

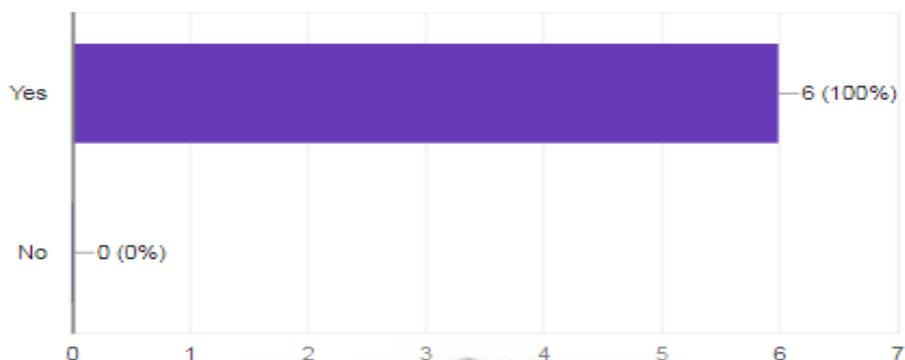
6 responses



Section C

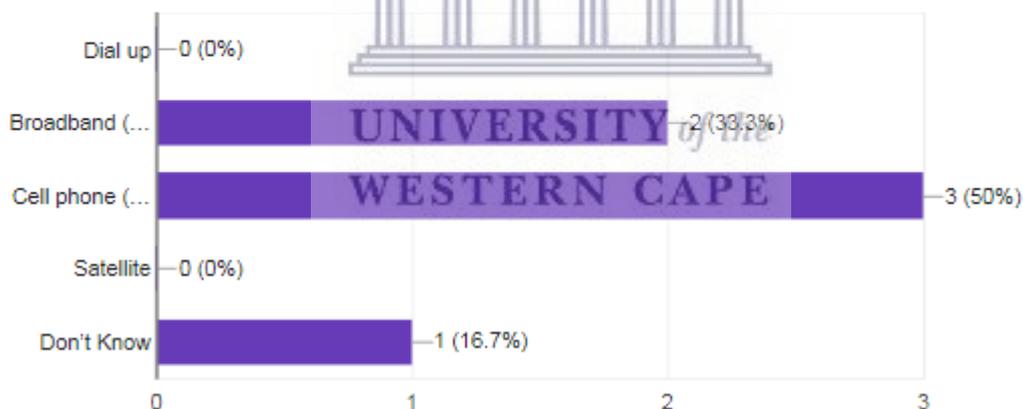
8. Are you able to connect to the internet off campus?

6 responses



9. If yes, what type of connection do you use most often?

6 responses

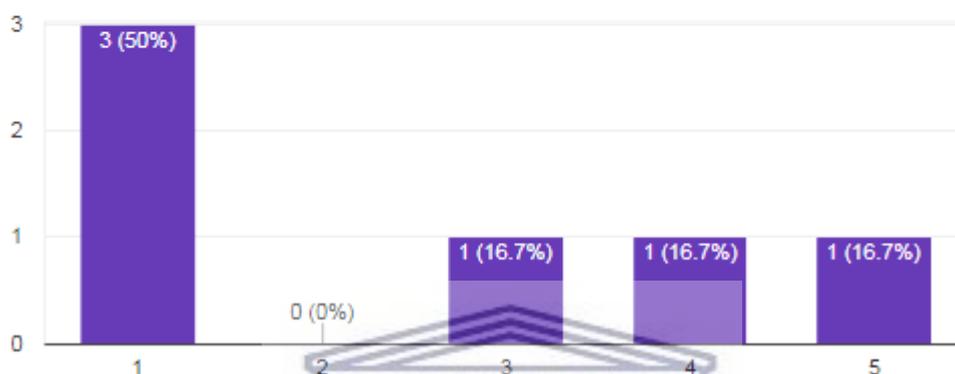


10. I use my mobile device, e.g. smartphone, notebook, laptop, etc. to help students with the integration of theory and practice of the ENT health assessment in the primary care and clinical skills module off campus.

0 responses

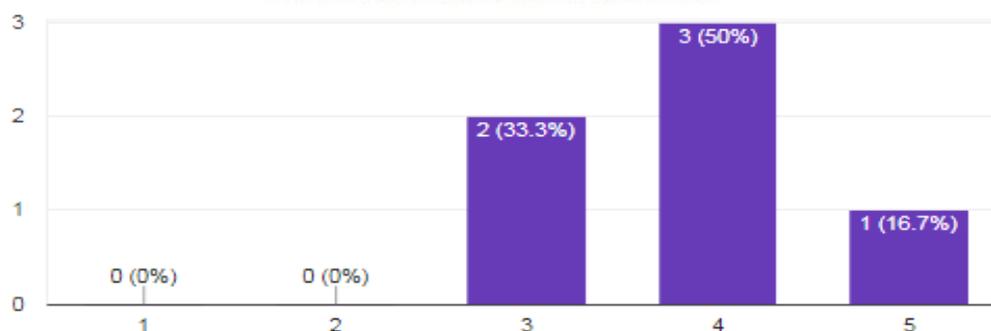
11. I am able to use my mobile device to access library databases off campus, e.g. EBSCO, ERIC, PubMed, etc. in order to do my own research on the ENT health assessment in the primary care and clinical skills module.

6 responses



12. Are you prepared to use your mobile device, e.g. smartphone, notebook, laptop, etc. to help students with the integration of theory and practice of the ENT health assessment of the primary care and clinical skills module off campus?

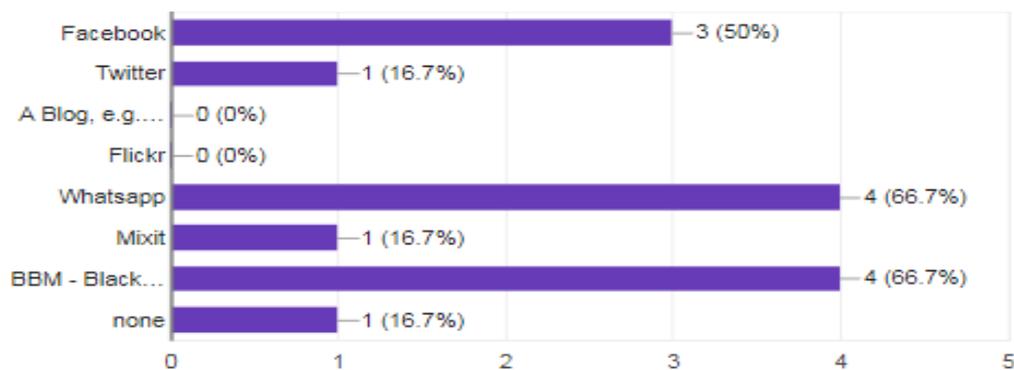
6 responses



UNIVERSITY of the
WESTERN CAPE

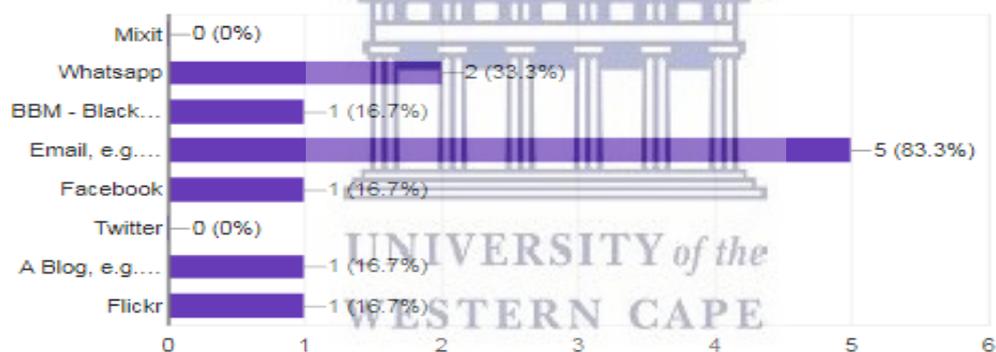
13. I make use of the following mobile applications.

6 responses



14. I am interested in using the following mobile applications to review those tasks received from students that are related to their coursework.

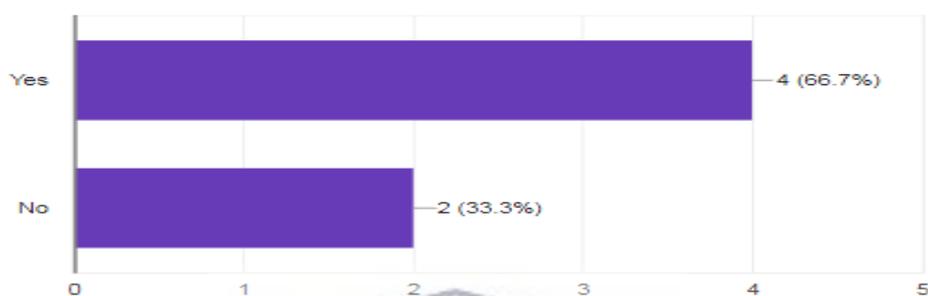
6 responses



Section D

15. Do you ever use your mobile device to help students with the integration of theory and clinical practice, e.g. while in the clinical field doing practical work and would need to consult with you on a particular ENT health assessment case they are dealing with?

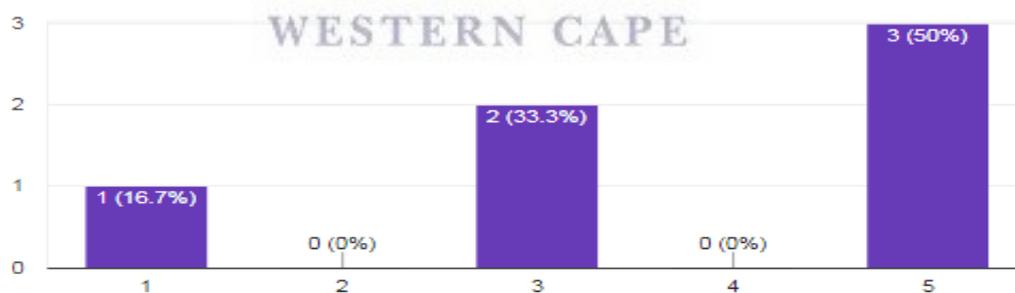
6 responses



In the following questions, indicate, on a scale of 1 + 5, your degree of preference for each method of communication with your students.

16. Offline Chats (e.g. SMS)

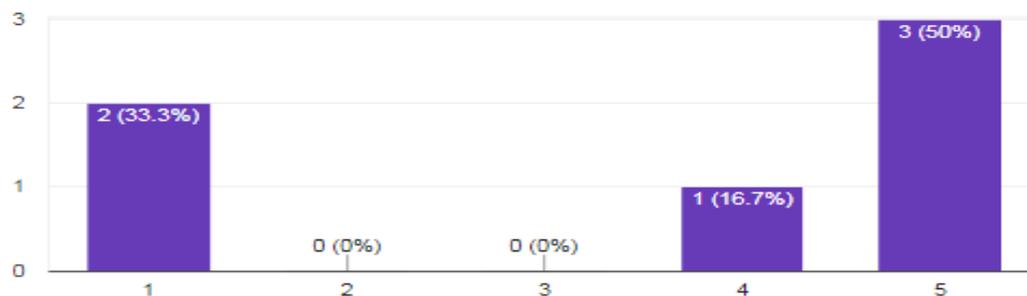
6 responses



UNIVERSITY of the
WESTERN CAPE

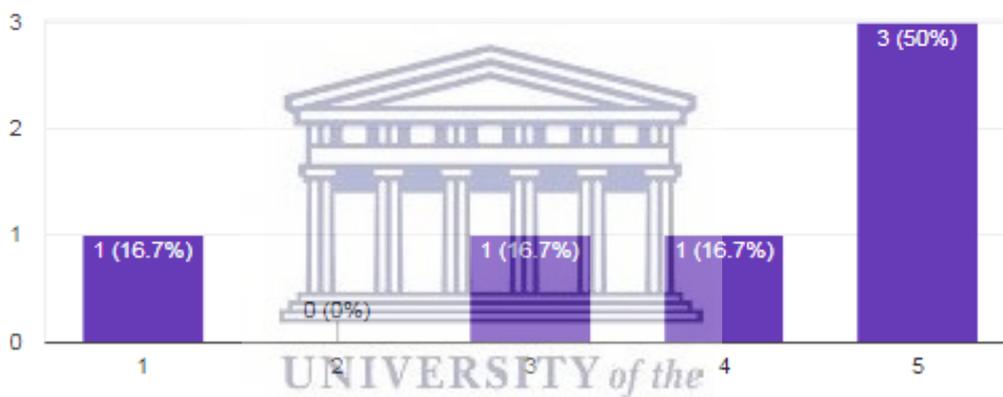
17. Online Chats (e.g. Mixit, Whatsapp, Skype)

6 responses



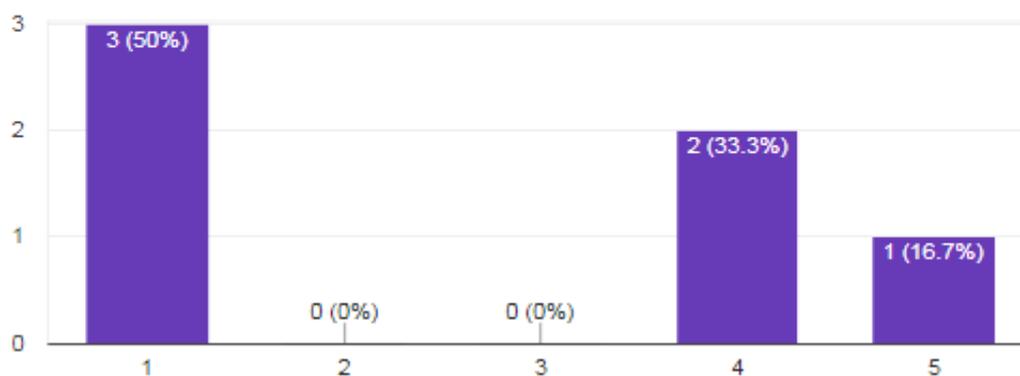
18. Email

6 responses



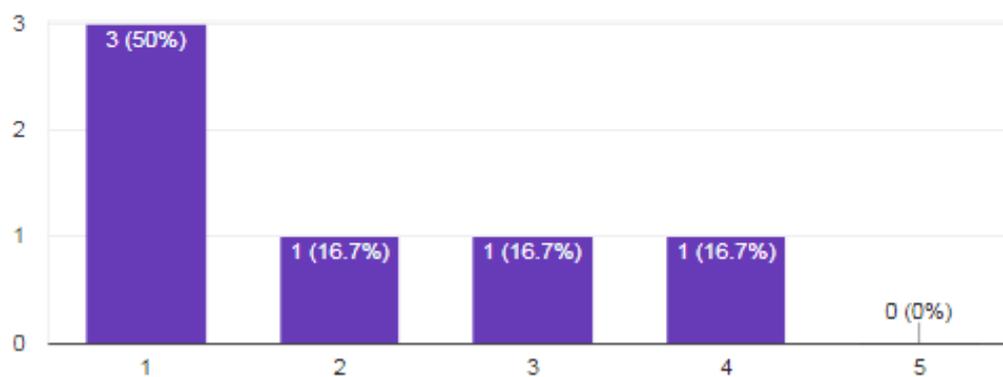
19. Online network community (e.g. Facebook)

6 responses



20. Blogging

6 responses



21. If it has been omitted in this section, indicate your preferred method of electronic communication with your students in the box below.

6 responses



22. In your opinion, can mobile devices be used by both students and lecturers to enhance the integration of theory and clinical practice of the ENT health assessment in the primary care and clinical skills module?

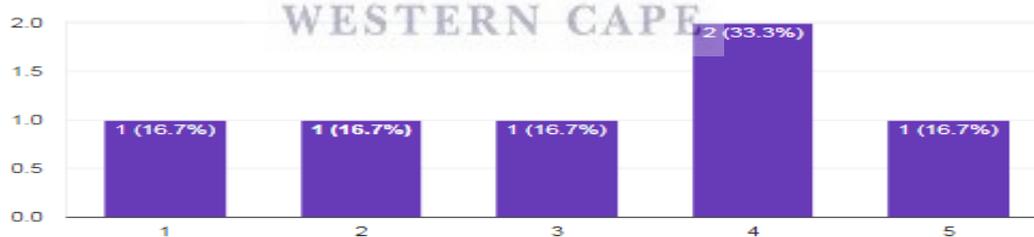
6 responses

Yes ...if planned properly and students and lectures get orientation on how use the service it can be achieved
I believe that mobile devices are the future of enhancing integration between theory and practice for our students in many modules and teaching platforms
yes
yes. today's technology provides a more cheaper form of communication for both the students and the lecturers to enhance learning by providing immediate feedback and by having active conversations and provide a platform for debates.
yes it can be used effectively especially if they want to know more or if they did not understand something clearly and then make immediate connect for clarification.
Can be used.

Indicate to what degree the following apply in your teaching context:

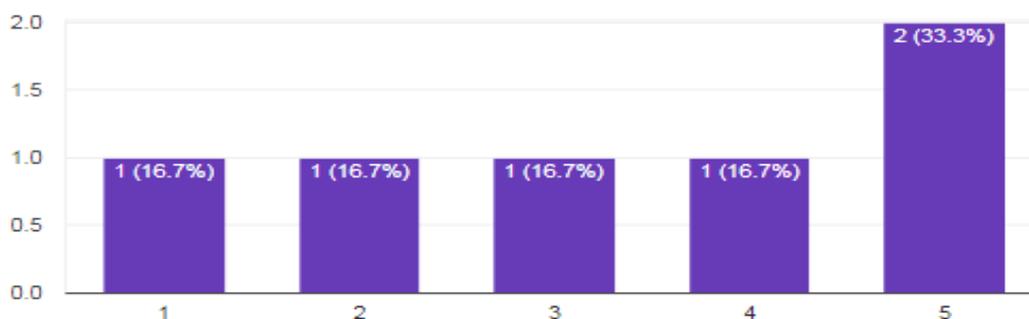
23. I am able to find and distribute content to students from the internet that is relevant to the course content by means of my mobile device. Indicate to what extend you agree with the statement. Refer to the Likert Scale ratings below to answer. NEVER - 1 HARDLY EVER - 2
SOMETIMES DO - 3 FREQUENTLY - 4 ALWAYS - 5

6 responses



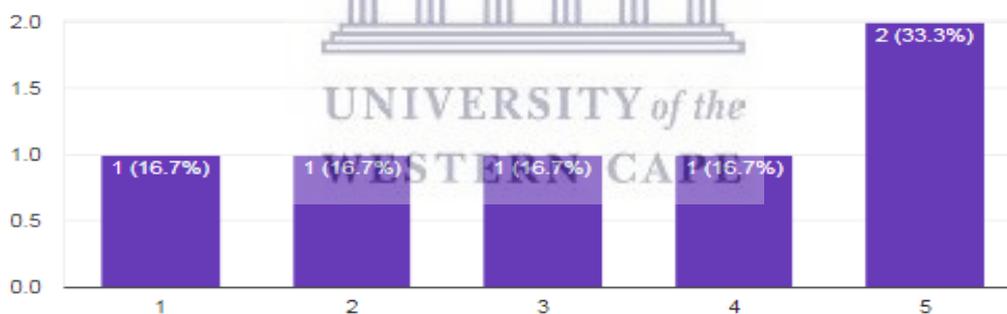
24. I am able to use my mobile device to develop my own content in an online learning environment for students to use.

6 responses



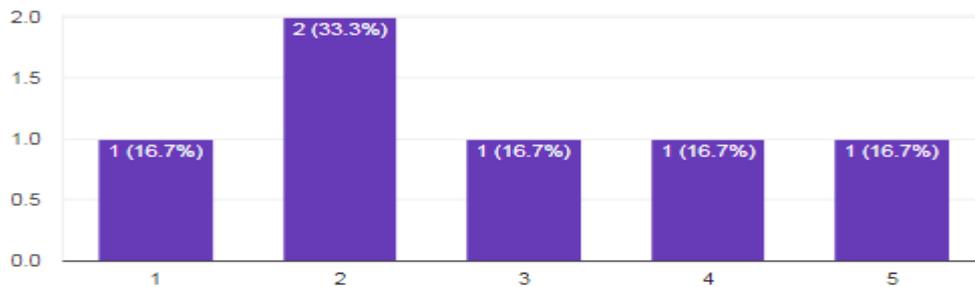
25. I currently use my mobile device in my teaching to communicate course information to students, e.g. changes in classes, assignment deadlines, etc. Indicate to what extent you agree with the statement. Refer to the Likert Scale ratings below to answer. NEVER - 1 HARDLY EVER - 2 SOMETIMES DO - 3 FREQUENTLY - 4 ALWAYS - 5

6 responses



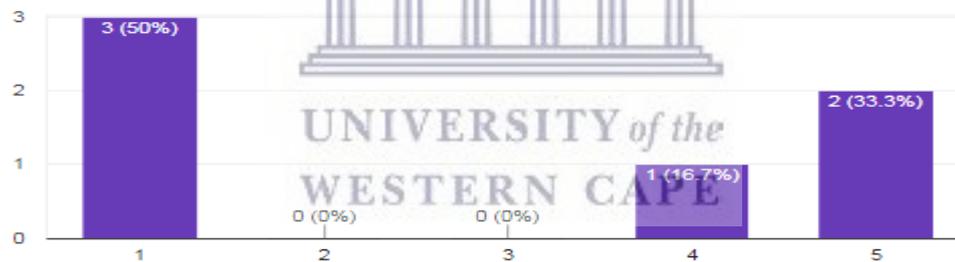
26. I currently use my mobile device to review course related pictures and videos made by students. Indicate to what extent you agree with the statement. Refer to the Likert Scale ratings below to answer. NEVER - 1 HARDLY EVER - 2 SOMETIMES DO - 3 FREQUENTLY - 4 ALWAYS - 5

6 responses



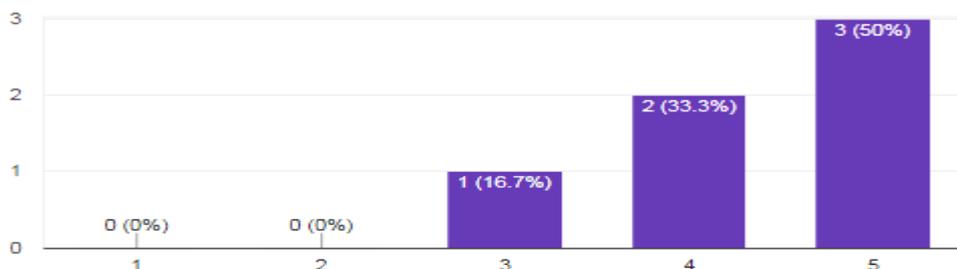
27. I currently use my mobile device to chat with students via Whatsapp, Mixit, Facebook, etc. to offer them academic support. Indicate to what extent you agree with the statement. Refer to the Likert Scale ratings below to answer. NEVER - 1 HARDLY EVER - 2 SOMETIMES DO - 3 FREQUENTLY - 4 ALWAYS - 5

6 responses

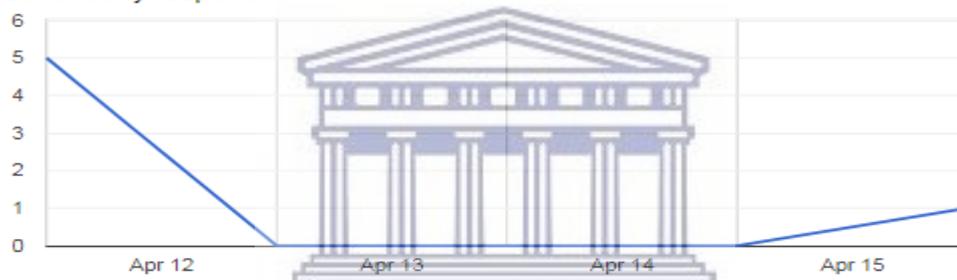


28. I am willing to engage with mobile devices to help students with the integration of theory and clinical practice of the ENT health assessment in the primary care and clinical skills module. Indicate to what extent you agree with the statement. Refer to the Likert Scale ratings below to answer. NEVER - 1 HARDLY EVER - 2 SOMETIMES DO - 3 FREQUENTLY - 4 ALWAYS - 5

6 responses



Number of daily responses



UNIVERSITY of the
WESTERN CAPE

This content is neither created nor endorsed by Google. Report Abuse - Terms of Service - Additional Terms

Google Forms

ANNEXURE 18: EXAMPLE OF A TRANSCRIPT – FOCUS GROUP WITH STUDENTS

Recording details	7110002
Length of recording	33:15 Minutes
Site	University of the Western Cape
Data collector	J. Willemse
Date of data collected	24 September 2014
Transcriber	G. Kassiem

STUDENT FOCUS GROUP 1 (SFG1)

INTERVIEWER: ... Looking at the results my question to you is: “How do you think the integration of theory and practice of the examination of the Head and Neck within the Primary Health Care Module could be done using mobile devices?” ...

PARTICIPANT 1: Okay, looking at the first results here it says that most of the students uses their laptop so I would say the ... means of communication would be acceptable is ... using the email. ... getting our information from you as the lecturer through email would be good. ... and most of the students can access from campus at home or wherever they is if necessary to, if it is necessary to use their smart phones or electronic devices they would also be a good means of communication or other information that is needed to give to students, WhatsApp is the most used under students at the moment. So this is my (silence, then laughing).

INTERVIEWER: Thank you for that contribution.

Some technical discussion around the recorder ...

PARTICIPANT 2: ... okay also to me ... when I look here emailing is the most application to use ... and also our mobile devices, those who have the phones, the smart phones they can use. That’s why emailing is important because you can be on the outside also if you don’t have laptop there are Internet cafes, so in there, in my area I mean, 15 minutes is R5.00 so its ... it is easy to go there even if you don’t have Internet at home even if you are off-campus so it is working. And also Facebook to me is it’s ah because some people like me they have the phone

but then I don't have access to WhatsApp, it ... denies access me to get it to WhatsApp ... so Facebook to me is It's only the other thing it's the other ... method of communication.

INTERVIEWER: So let me understand, so you say for you personally emailing and Facebook that is what is accessible for you?

PARTICIPANT 2: Yes ...

INTERVIEWER: Ok ... Thank you Sir

PARTICIPANT 3: ... for me I think its email being the first one ... that will be most usable by many people, ehh but some people they struggle to I think I think to use to use email somehow. ... and the second one being WhatsApp. I think most people ... use WhatsApp, but unfortunately WhatsApp is ... a specific to some phones. Others they don't download WhatsApp, but ... I think emailing being the top and WhatsApp the second one can be easy to access.

INTERVIEWER: Thank you

PARTICIPANT 4: Okay. First I would like to say ... thank you ... to ... participate in this survey because it is giving me a tip off like how to use for the ... smartphone for which purpose that's a good thing for me. So when I see for the ... the result of the survey people much using for the smart phone more than that for the laptop so ... what ... I'd like to say for smartphones it is a good way to ... communicate for (some confusing phrases) education or any involve mission. And that's my ... suggestion.

INTERVIEWER: Okay

PARTICIPANT 4: Thank you very much.

INTERVIEWER: Thank you ...

PARTICIPANT 5: Okay ... I agree with ... what my fellow students have just said currently that emails is one of the major things that we, the one that we use the most more than the others. Then Facebook is what we also use then ... we use because all the smartphones they do have access to Facebook. ... WhatsApp is also good, it's just that tricky that some smartphones don't access to WhatsApp so and currently even those cell phone providers they don't specify that this one has access and that one don't have. So it becomes tricky that way. WhatsApp is good also

..... cheaper than facebook ... but ... facebook and email is currently can give anyone access, especially those one who have numbers who can't access WhatsApp.

INTERVIEWER: Thank you ...

PARTICIPANT 6: Me too I would put the idea of my colleagues that said email is the most accessible for the student even if you were not here at the campus because outside you can get it cheaper. Internet access you do whatever you're supposed to do at any time you want. And some other phone is very expensive to buy or it like me I can only afford this Nokia that can give the WhatsApp and and Facebook (unclear) that phone must be very expensive for students to buy, but email is very very cheap. This WhatsApp and Facebook can also be very helpful.

INTERVIEWER: Thank you. I would like to ask you one question, in the survey you indicated; only 5% indicated that Mixit could be an option to integrate the theory and practice of the examination of the Head and Neck. Does, do anybody use Mixit still?

PARTICIPANT 1: Some

Additional notes: A lot of mixed responses followed and from their facial expressions it was clear that they are not interested in Mixit.

PARTICIPANT 3: I do use Mixit, but most people don't use it, like people that are in a tertiary level they don't use Mixit. It is being used by ... scholars that are in high school who ... and replaced by the new things, BBM and WhatsApp. So Mixit I think cannot be used.

INTERVIEWER: My question is, do you guys have the application available on your phones to do Mixit? Some mumbling ... Is it a free application? Some mumbling ... is Mixit a free application?

PARTICIPANT 1: You do pay. You can download it, but it takes megabytes to download and why should, why would you download a message ..., that none of your friends or colleagues is using? What is the point of that? You're losing data where you can use the data for WhatsApp, Facebook or email. So it's unnecessary.

INTERVIEWER: Thank you so much for that. My question to the group would be: you've, you've ... in summary ... in summary you've discussed, you've indicated email, WhatsApp and Facebook. And it's those three.

A GENERAL RESPONSE FROM ALL PARTICIPANTS: Yes

INTERVIEWER: And it's those three. Would you want us to use all three of those to communicate, would you want us to use two to communicate or do you want us to use just one to communicate with you to assist you with the integration of theory and practice because remember you're going to be in clinical practice, you're going to be in the clinical field anything that / where you need help with you need to be able to communicate with your lecturer or clinical facilitator. What will be the best way to be able to communicate in real-time with your clinical facilitator or with your ...

A GENERAL RESPONSE FROM ALL PARTICIPANTS: WhatsApp and Facebook are the top two choices

INTERVIEWER: I can be in this office and you can be in the clinical field and has any challenge with the examination of the head and the neck and you can contact me and I can respond in real-time.

A GENERAL RESPONSE FROM ALL PARTICIPANTS: The response to this statement is still WhatsApp and Facebook.

INTERVIEWER: Okay ...

PARTICIPANT 4: What I am suggesting for my suggestion is that WhatsApp is the best one, Facebook sometimes when you open its network ... is slow and it is not like ... quick communications that going to happen. So, WhatsApp is very quick...

INTERVIEWER: Do you feel that WhatsApp is the best way?

PARTICIPANT 5: The reason why I like include them both, is to accommodate those whose phones can't access WhatsApp so that it can be easier for them to communicate. So because if it is just WhatsApp it would mean they would be left out because of their phone can't the proper, the WhatsApp properly. So when it's both Facebook and WhatsApp then it will make it easier for everyone.

PARTICIPANT 4: Jah, what I am saying is not only WhatsAppmixed talking ...the first choice should be WhatsApp.

INTERVIEWER: So ... the first choice should be WhatsApp?

A GENERAL RESPONSE FROM ALL PARTICIPANTS: Yes

INTERVIEWER: Oraait ... you guys mentioned earlier, mentioned earlier that it is WhatsApp, Facebook and email. If you have to choose two having already indicated WhatsApp is number one at the moment. Am I right?

A GENERAL RESPONSE FROM ALL PARTICIPANTS: Yes

INTERVIEWER: That is my understanding from this focus group discussion WhatsApp is number one.

A GENERAL RESPONSE FROM ALL PARTICIPANTS: Yes

INTERVIEWER: What will be number two, Email or Facebook?

Some deliberation by participants

PARTICIPANT 6: Facebook, it will depend even if I've got one page it will be better to put on email ... you can just do this do this then I get the message on WhatsApp then that's it.

INTERVIEWER: ... So then you are saying that your preference would be WhatsApp and email?

PARTICIPANT 6: Yes (Jah)

INTERVIEWER: ... I am going to (gona) send it around then you must just give us your preference.

PARTICIPANT 1: Must we explain why too

INTERVIEWER:

PARTICIPANT 1: I choose WhatsApp and email. For that my explanation is, for me Facebook is a social network and for me I would not want the friends I have on Facebook to see my studies, unless it is via messaging, its only me that's seeing it, but I feel it is unnecessary for my friends to view my information on Facebook to see my clinical or read the notifications that I am getting. It's my personal (voice fading away)

INTERVIEWER: Can I ask you a question? And you need to clarify this for me; if we establish a Facebook group for this group will your friends still see your notifications on your Facebook page?

PARTICIPANT 1: If I comment in it.

INTERVIEWER: If you comment in it, I understand what you mean then yes.

PARTICIPANT 2: ... I would say ... email and WhatsApp.

INTERVIEWER: Email and WhatsApp?

PARTICIPANT 2: Yes because sometimes you have to communicate and you have to ... (unable to hear) via Facebook, ... the whole screen ... because it would stop you somewhere. Then by emailing there a lot of stuff you can get so WhatsApp and emailing. I will do the same if we choose two. Yes ... laughing.

PARTICIPANT 3: For me it is going to (gona) be WhatsApp as I have said before. WhatsApp is ... the best because you also get to ... record yourself. Like for instance I would like to record what myself and then send you the voice note. That option is very best for me and you can be able to communicate and it is not costly to make a voice note and send it. It cost about 10 cents to do it, so it's going to (gona) be very ...easy for us if we are going to communicate with WhatsApp. And ... the second one and ... email. But email and Facebook for me I can't say like this because Facebook you can go on inbox ... a private conversation then you can communicate very well there and there would be nothing that will be seen by others and you can put a lot of information there. Like the only way I think Facebook limit you in terms of the permission that you put is when you use the application on your phone. But if you browse facebook on the Internet then it will it will limit you. And also coming to WhatsApp, WhatsApp will also like its gona be very quick for you to be able to communicate with WhatsApp because if you send something to someone you will get a notification as a sms then you will respond quickly. Like on Facebook you can send a message depending on your setting on Facebook might not show then and you will, you will realise when you online, maybe in three hours you see, you will just send the message now and then then person that you send the message will get a notification and then she will respond immediately.

INTERVIEWER: Thank you for that ... is important information to share. Thank you.

PARTICIPANT 4: Okay still up ... I'm suggesting for the first is WhatsApp but the other student said for email. Email also is a good option because one student she's saying ... to take to take for ... long like ... a document is not easy to open up on your WhatsApp, so I agree for that.

PARTICIPANT 5: ... what said now I agree with him 100% on WhatsApp as well as on email. What he said was true, WhatsApp use if you have send a message you get it now, respond now so it makes it very quick. And also email now is good, especially now where you have to have some documents that you have to print, so email would be the best option for that so the top two becomes email and WhatsApp. Yes ...

INTERVIEWER: So my understanding from this this last discussion is that that you're first choice would be WhatsApp and your second option would be email. And email specifically because it can accommodate larger documents that cannot be accommodated on WhatsApp. I would love to thank you for this this has been very valuable information and I am sure this information will guide us in the preparation for the implementation when it comes to the time that you that you will be doing this section the section of the head and neck so that we can help you with the integration of the theory and the practice of the examination of the head and the neck. Thank you so much for your time, it is appreciated. Is there anything you would like to add still?

PARTICIPANT 3: ... on what I have just said on the voice note, I really believe that that one would be because if you communicate verbally and in writing it will become clearer ask and then you record yourself and then you reply with a voice note it would make life very easy.

General comment: Is it multi-tasking? All laughing

INTERVIEWER: So you're going to teach me to multi-task ...

Some laughter among the participants in the focus group

INTERVIEWER: Thank you very much. Is there anyone that would love to ask anything else or add if there is anything? Anything that we have not talked about that you would want to bring up?

Some soft rustling while the participants are moving around in their chairs!

INTERVIEWER: Nothing now?

PARTICIPANT 5: When we think about something then we can approach it.

PARTICIPANT 1: We're very fortunate. There is some students out there that does not have the facility of using email at home or wherever they are. ... in their cases what if they don't have a

smartphone, so in their cases what would the means of communication then be then? Do they have to come to campus? Do they check their emails? And then they receive the email late, got the information late, see it's difficult. We're choosing what is appropriate and what we want, what we can access. But what about those who can't access anything? Messaging is costly, phone calls is costly, so yes ... (voice fades away).

INTERVIEWER: I think that is why it is important to have the focus groups sessions between the two classes. I am having focus groups with class one and I am having focus groups with class two. And then we will decide after all the focus groups that we had, as long as new information comes out I will keep on with focus groups, but as soon as we see that we are getting the same information from all the students, then I can stop and we can make a decision on which method will be the best to use, because that can be a limitation if students don't have Internet access but fortunately with the survey we have seen that most of the students have Internet access off-campus. And that is a good sign for us for this whole m-learning uhm initiative, but also also the the response of WhatsApp which is a cheaper option to to help with the integration of the theory and the practice so so we will look into that. It also depends on what all the other students decided, but I will relay relay the results with all of you.

PARTICIPANT 2: ... I think mam the other students, they have access on Internet in such a way that they go to Internet cafes like I have said ... process at the Internet café ... pay R5.00 for 30 minutes that so they don't have Internet at home like here.

Some mumbling in the group

PARTICIPANT 1: But isn't that an inconvenience for you?

PARTICIPANT 2: Yes ...

PARTICIPANT 4: Like just to add on that, on top of that, now the city introduced more computers now in the public libraries in our areas. Because now in our areas now since it has started being last year we've got access to Internet 45 minutes free of charge. So now it makes things even more easier now.

INTERVIEWER: Thank you for that contribution.

PARTICIPANT 4: Yes I know about that but Those computers with that limited time, but if there could be the rule off monitoring the people entering there because some they're just there to Facebook and stuff, there to check important stuff that could be that could make stuff easier.

INTERVIEWER: Thank you, those are valid challenges we have to, that we have to discuss, that we have to talk about. Uhm emailing can be a challenge that is what I am getting from all of you now that emailing can be a challenge. So so so even Facebooking can be a challenge for some students who don't have access to the Internet. Thus far WhatsApp (appears) to be the best option. You agree with that?

A uniform response of yes received from all the participants

INTERVIEWER: Because that is what I get from the discussion. We've got WhatsApp number one, then we have a lot, all of you said email as the next option and then some of you said even Facebook can be another option, but ... what I hear from you and the concerns on the limitations that might be very real to certain students, WhatsApp is the best option from this group.

PARTICIPANT 2: To add on that ... WhatsApp is the really... really the best option. It can be only the limitation if you can't get WhatsApp on your phone I ... it is not costing that much (voice fades away).

Some laughter among the participants in the focus group

PARTICIPANT 4: ... And the now ... Just on WhatsApp now it's becoming, it's like so getting easier now. There is because currently looking at the type of the mobile phones that WhatsApp is old phones

Some laughter among the participants in the focus group

PARTICIPANT 4: ... Because these new phones now currently getting cheaper and cheaper every day now so it's becoming easier now to access. I was just thinking about problems accessing WhatsApp from those phones, old ones, 2009 models, but now with the new phones, it's getting better ... laughter ...

INTERVIEWER: Can I ask? Who does not have WhatsApp?

After a show of hands in the group only one did not have access to WhatsApp.

INTERVIEWER: You guys are a group of six and only one don't have WhatsApp. Will you be able to download WhatsApp? (This question was directed at the participant who does not have access to the WhatsApp application on his mobile device).

PARTICIPANT 6: Not on that phone.

PARTICIPANT 2: Not on this phone.

Some very soft discussion among the participants in the group

Like you does just need to go to someone who knows

When I download the size of my phone..

Oh it's the space, okay

INTERVIEWER: So if you're saying that the size of your phone, will you be able to download WhatsApp if we decide to use this application? What is gona happen to you because you will not be able to converse in real-time with me if you have a challenge, you cannot contact your supervisor, you cannot contact your colleagues, lecturer because we will be available on WhatsApp. We will not be physically in the facility, but on WhatsApp. How are we going to help you?

PARTICIPANT 2: ... that will be difficult mam, that will be a challenge, also the sms'sing, it costs ... I don't know ...

Some giggling among the participants. The participant appeared comfortable with the giggling and joined in with it.

INTERVIEWER: Will you be able to borrow somebody's phone to use for a certain period? Will you have access to WhatsApp?

Yes, yes if I've got someone, a colleague next to me I can

INTERVIEWER: Will you

PARTICIPANT 2: I can still WhatsApp. Yes that can happen. This will not cost too much (Some unclear input by other members of the group)

Some laughter among the participants in the focus group

There will be no It will just be integration of theory and practice of the examination of the head and the neck. That will be the conversation. And you guys will focus specifically on the ear, the nose and the mouth and throat. Ok.... So that will be the conversation (still some giggling in the group) we will be having on WhatsApp. So if you use a colleagues phone, if you have access to a colleagues phone and you can use WhatsApp, then by all means you could do that to be able to communicate.

... at the beginning of the whole thing you mentioned using all three options.

INTERVIEWER: We're going to (gona) have to decide on the best option for everybody and we have email as a back-up.

Some form of agreement sounds made by the participants.

INTERVIEWER: We have email as a back-up for larger documents now, but the main thing that you guys have talked about Response from the group ... WhatsApp ... The important thing is that we will all use the same system (response from a participant) across board. For us to communicate, if we decide on WhatsApp, we will establish a WhatsApp group and then everybody can follow the conversation and help learning take place for everybody because I might see a different case today, you might see a different case tomorrow, but whatever we're discussion everybody can follow the discussion in a WhatsApp group and in that way we can all help one another with the integration of theory and practice and it will enhance teaching and learning.

PARTICIPANT 3: On my experience of WhatsApp I am not sure if I haven't exhausted everything in terms of knowing WhatsApp. I don't know if WhatsApp does have a group.

The response from the group and INTERVIEWER is yes it does. Some mumbling in the group

INTERVIEWER: And then everybody sees what happens in the group. Whatever information we send around, whatever queries we send around, everybody will be able to see it

Some confirmation on this from the group

PARTICIPANT 3: This is going to (gona) be good.

Some mumbling in the group

PARTICIPANT 4: What I would just like to ask, ok currently we were saying that ... WhatsApp is going to (gona) be based on the head and the neck (assisted in the group) what I would like to ask is that just now for the beginning, just now for the beginning or ... are there gona be more other things that are going to (gona) be communicated via WhatsApp for instance.

INTERVIEWER: The focus of the study as I explained in the participation form or the information leaflet that I have handed to you guys, as we've discussed this is research and it will just be for Primary Health Care, it will just be for the examination of the head and the neck to help you with the integration of the theory and the practice (some echo of understanding in the group). So for this study it will just be primary health Care, specifically the head and the neck. That will be the focus (**echoes of okay from the group**). That will be the time that we are using this and ... if everybody is comfortable we can continue with it (**echoes of okay from the group**) for the rest of the module, but for now we will specifically focus on the head and the neck for this study for now, for now yes.

PARTICIPANT 3: so in future they may see the success of this and decide to implement it on more other things now. Okay ... (some echo of agreement from some other group members)

INTERVIEWER: I think the importance of the study is we want to, want to create a platform of edu ... of communication using your mobile devices. It is something that you have on you all the time (**some mm's of agreement from the group**) and we see you on-campus and then you go into the clinical practice field and in clinical practice if there's obstacles, there are things that you struggle with ... the integration of the theory and the practice and this is just to see can we use mobile devices to help you with the integration, especially when you are off-campus (**some mm's of agreement from the group**), when you are within the clinical field because you don't have a clinical facilitator with you all the time (some echo of agreement by saying "yes" from some of the group members). You don't have a lecturer with you all the time. So we want to see can we use our mobile devices as a tool to help you and your lecturer with the integration and with teaching and learning. Yes (Yah) ... any other questions?

An echo of no questions from the group

INTERVIEWER: Thank you very much for your time and surely we will be talking again soon. What I'm going to do is I will transcribe this information and I will give each of you a copy to look at it to make sure that what we have talked about is what is on the paper (echo of okay from

the group) then you can check it and hand it back to me. So I will give this information to you to look because you must look and see is this what you've said (echo of okay from the group). Oraait we have to do that. Thank you so much for your time.

(End of transcription)



UNIVERSITY *of the*
WESTERN CAPE

ANNEXURE 19: EXAMPLE OF A TRANSCRIPT – FOCUS GROUP WITH LECTURERS AND CLINICAL FACILITATORS

Recording details	7110010
Length of recording	56:35 Minutes
Site	University of the Western Cape
Data collector	J. Willemse
Date of data collected	23 September 2014
Transcriber	G. Kassiem

FOCUS GROUP WITH LECTURERS AND CLINICAL FACILITATORS

INTERVIEWER: Good morning, everybody. As you know, my name is Juliana Willemse. I'm a registered PhD student at the school of nursing and I've invited you to participate in this focus group as part of my data collection for the planning around the implementation of our session of the second semester of our students. Firstly, I would like to inform you that... consent form. You have to give me a written consent form to be able to be part of this study. You also have to understand that you can withdraw from this study at any stage. I have given each and every one of you a number and you will be known as participant 1, participant 2, participant 3 and participant 4. That is to ensure anonymity. So that nobody will know who said what and you have to know that all the information that you share here will be confidential. The only people who will know about the information that you share here is myself, my research supervisor and my co-supervisor as well. After this session all the information will be transcribed and I will give the transcription to you to verify that the information that is on the transcription is what you've said in this focus group session.

As I said before, this focus group is to inform us on the implementation of a project and I need to ask you this morning, as primary health care practitioners and also as lecturers and clinical facilitators, working with students that are doing the primary health care module or working with

students, you are going to work with students in the primary health care module. In the second semester, because this is for the second semester that we're going to do

My question to you is, at the moment our students are doing the primary health care module and we found that with our students there's some disjuncture between their theory and their clinical practice. They can't integrate the information and we need to find a way to help them with that integration process. *So the question that I'm posing to you this morning is, how do you think the integration of theory and practice of the examination of the head and neck within the primary health care module can be done using mobile devices?*

We had a previous session (*conceptualisation session*) where I informed you on the whole process and the content of the study. The study is about m-learning, the topic of the project is 'The affordance of m-learning for the undergraduate nursing programme' and it is a design base study and using mobile devices where we're looking at a way in which we can help students to integrate their theory and practice.

So what happens in class and what happens in the clinical facility, we need to find a way for them to make that type of connection where their work is concerned. At the end of the day they will not be only good academia, they will not only be good in practice, but they will be all-rounders when it comes to them being a practitioner. So I will set it open to the floor to give your ideas. There is no right and there is no wrong answer. Any contribution that you give will be appreciated. Please refer to a number when you respond to somebody. If you could please not use names! Anybody?

PARTICIPANT 2: So I'm participant 2?

INTERVIEWER: You are participant 2 yes.

PARTICIPANT 2: So we're just concentrating on the head and neck. That means it includes the history taking, the examination of the ear, eye, nose, mouth and the lymph nodes. So you want to know when we're in the facility, when it comes to the practice, so we can reflect then on the theory that they did in the class and we apply it in the clinical practice.

INTERVIEWER: Yes, you must remember before the student goes into the clinical facility, they've done for example, as you've said before they've done history taking of the head and the neck. So when they go to the clinical facility and they do the history taking of the head and neck,

there must be way in which we can help them to integrate what they've learned in class and what they are doing in the clinical facility.

PARTICIPANT 3: I was thinking that everybody is walking around with a mobile device and by putting all the content or making it accessible for them there should they come across, for example, a nose condition, then they can just go in there, read up all the signs and symptoms. That will be the content, the theory. So then they can make that connection. So if it looks like this it's got to be this and this will be the management. So they will have this to guide them, the mobile device to guide them.

INTERVIEWER: So just for clarity, I define mobile device as anything that is movable; whether it is your phone, your laptop, your iPad, your Galaxy pad, whatever you can move around with you I define as a mobile device. So you're referring to, participant 3, specifically to a mobile phone, but we feel that anything the student can use that is mobile that you can take into the facility.

PARTICIPANT 3: I am thinking this thing is small. Everybody is walking around with a phone in their pockets.

INTERVIEWER: So that's a brilliant idea to use a mobile phone for that. We've done a questionnaire with our students and from the questionnaire; we see that all of them have a mobile phone. There is a small percentage that does not have Internet access on their mobile phone. The majority do have Internet access on-campus as well. So they should have access in the facilities, but the understanding is that they will use their own mobile device with their own Internet connectivity, which means with their own time and their own money to connect in the facilities currently. That is the current status quo of this research.

PARTICIPANT 2: There are different applications that they can use. So what about WhatsApp if you don't have Internet access?

PARTICIPANT 3: Does it work without Internet access?

PARTICIPANT 2: Yes, WhatsApp works without Internet access.

PARTICIPANT 3: So we can just post our lectures on there and even if the students have some queries they can just contact us and then we can discuss whatever their queries is with them.

PARTICIPANT 2: So they can send in their queries or anything that they find in the clinic. They can send in their queries to the lecturer and you can have a discussion over WhatsApp, which is applicable to what they have found in the clinic. But we're not supposed to take photos?

INTERVIEWER: No, without permission you cannot take photos.

PARTICIPANT 2: If the sister gives you permission...

INTERVIEWER: No, there must be permission from the Department of Health to take photos in the facilities and also the patient must give you permission to take a photo as well. So I've asked two facilities, I've asked for (*facility name removed*) and I've asked (*facility name removed*), we have not had a response yet. So I've just re-submitted my request, but if they do not give us permission to do that in the facilities, our students can use the Internet, they can use textbooks and they can use the skills laboratory for us as an alternative measure to help them with this integration of theory and practice. So we do have a skills laboratory available.

So at the moment you said that they've got mobile devices and you suggest using their mobile phone because it is a smaller device and it can go into their pockets. Then also, the discussion is on WhatsApp now because on WhatsApp you can send notes, you can send pictures, you can send videos and it is a cheaper alternative for students to use. Anything else?

A long silence

INTERVIEWER: Remember, our focus is the how. So the how Ikamva, the what – we've talked about the mobile phone. The how we help them with the integration is the main concern and you said that we can post lectures, we can tend queries. They can communicate with you about whatever they find in the facilities, they can communicate with you via WhatsApp? Now if we look at when we're saying post lectures, what do you post?

PARTICIPANT 2: You can also post pictures.

INTERVIEWER: You can post pictures.

PARTICIPANT 2: Pictures of abnormalities, like an ear infection, what does it look like. A nose infection, what does it look like.

INTERVIEWER: Do you want to post or should they post?

PARTICIPANT 2: But they won't be able to take photos of a person's ear and nose, because they must first get the permission.

INTERVIEWER: Where can they... if they're not allowed to take pictures in the facilities, where can they get pictures from?

PARTICIPANT 2: They can get it from the Internet.

INTERVIEWER: Okay, pictures from the Internet. You said on abnormalities found.

PARTICIPANT 4: I think we should direct the students with references, because we don't want the students to be exposed to any type of Google articles or documents. I think we should really prepare our course outline and our course material, so that we can direct our students to where we want them to be. Because I think if we are just going to say any reference, they're going to use any scholarly material that they can find, which we don't want. Because we want to lead them to a direction.

INTERVIEWER: Can I just get clarity, you said scholarly. Do you want them to look at scholarly references?

PARTICIPANT 4: Yes.

INTERVIEWER: My understanding is you don't want them to look at Wikipedias?

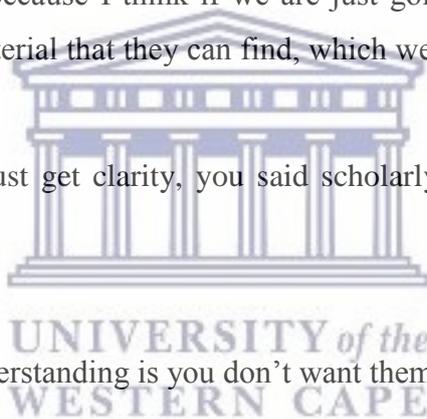
PARTICIPANT 4: Yes

INTERVIEWER: And use that as a scholarly reference, because that is not a scholarly reference.

PARTICIPANT 4: Yes.

INTERVIEWER: I understand what you're saying. So your suggestion is that we should have scholarly references in their module guide on where they should look for?

PARTICIPANT 4: Not specifically in the module, we can even post. Let's for example say if a student ask you a question and you want to assist the student to getting the correct answer, then you can perhaps give the student a reference, a link, go to this site and check out this article and



Participant 2: Ja (yes)

INTERVIEWER: That is interesting. That is interesting.

PARTICIPANT 3: You know, sometimes it is not possible for us to be always there with the students. So, going back to the WhatsApp, sometimes the students come across conditions that they're not so sure about. With the sisters being away, they just needs to ask questions. So then we can use WhatsApp to guide them also by giving them signs and symptoms or asking them to give and then you can direct and guide the students towards the correct management and things like that. So that will be integrating theory to the practice.

PARTICIPANT 2: Or even telling them what reference, because they have a whole lot of reference books, so you guide them and tell them to go to their reference book, like your EDL and go look up the signs and symptoms and the management of the condition. And sometimes...

INTERVIEWER: They have it electronically, so we can WhatsApp that to them.

PARTICIPANT 2: Okay. You're EDL, and your... what's the other one? The blue one? Palsa Plus and your IMCI.

INTERVIEWER: IMCI will not fit in here, because we're going to work with adults, but the Palsa Plus will fit in and the EDL will definitely fit into this. So let's look at where we are now. We're saying that WhatsApp, mobile phone, WhatsApp. We're saying that students can communicate with you if there's any condition that they see that they're not sure about and they want your assistance, they can WhatsApp you on their queries, and you can guide them by sending them, not the answer, you can guide them by sending them links and scholarly references, as Participant 4 has mentioned earlier. And also, we can give them guidance towards the management, and we can even give them electronic resources that we can send to them on WhatsApp. I don't know the capacity of WhatsApp. Whether WhatsApp can take a book!

PARTICIPANT 2: I don't think so.

PARTICIPANT 4: I don't think WhatsApp can take a book.

PARTICIPANT 2: But what other application can they use besides WhatsApp?

PARTICIPANT 3: And Facebook? Won't they be able to...?

INTERVIEWER: We can see if Facebook can take that.

A long silence

INTERVIEWER: We also have a learning management platform.

PARTICIPANT 1: Ikamva?

INTERVIEWER: Yes, Ikamva is the one that is currently being introduced at to university and training can be arranged for Ikamva. Training and essentially, with Ikamva, you can communicate with your students, you can put books there and you can references there, and it is always like a one-place shop where they can go to. You can put their module guide there. You can put test books there, you can put scholarly references there. You can do a one-on-one communication with your students on Ikamva as well. And it can happen in real-time.

PARTICIPANT 3: And will it be accessible on their phones as well?

INTERVIEWER: It will be. They go to the university's website, not the university's website, to the Ikamva website (*ikamva has been integrated into the university website*), and they should be able to access it from their mobile phones as well. We had to look at affordability. The students indicated in the questionnaire that they do have Internet access off-campus and that they will be able to afford going onto Ikamva. So that is another platform that we can look at.

PARTICIPANT 4: I think if we need a bigger application... because if you look at Facebook and WhatsApp, yes, Facebook you can have discussions. You can share content, but you are limited to space. So we need a bigger application whereby we can use it to introduce this method to the student, because it will be easier, it will be workable.

PARTICIPANT 2: What about the blogger? Will that work because you can put a lot of information on there!

INTERVIEWER: There is a blogger (*discussion forum*) in Ikamva. So the platform does have a blogger application as well. You can blog on Ikamva as well.

PARTICIPANT 4: Because I think what the students want, the students want discussions, because it is from the discussions that they will actually learn. Let's for example say, if Participant 1 has her views on a condition of the eyes, then we can have a discussion to clarify. Perhaps even refer the other participant or the other student to a reference, say but check on that page. There they give you the signs and symptoms of the infection.

PARTICIPANT 3: I think in Ikamva you can set up groups.

INTERVIEWER: Yes, you can.

PARTICIPANT 3: So that will allow for the discussions that you're talking about. So if we can set up that.

INTERVIEWER: As a primary health care lecturer, one of the things that happens in the module guide, students get marks for their presentation. So if there's a group discussion, essentially, at the end of the week when they come to the class, they can actually present their discussion and their findings and their marks can be awarded to this, because this will reflect, as you say a group discussion on Ikamva per group, that group will reflect what they've done for the entire week. So we give them a mark for the work that they've done, because they've not only done it, they've done it with guidance from a lecturer or the clinical facilitator. So essentially, when they come to class, their tasks for the week would be complete and because they've been in direct communication between the clinical facilitator and the lecturer for the entire week, that could've helped them with the integration when they come to class and they come and present a discussion, there should have been an integration of theory and the practice by the end of that week.

PARTICIPANT 3: I think that will work wonderfully, because while they're in there they can relate this is the content, so this is what it's supposed to look like, management, signs and symptoms and all of that. So this is how I'm going to apply this to this for the blogger. I think it can work.

INTERVIEWER: And with the online communication with our students, we can also probe them to see how much of the anatomy are they bringing into the third-year. How much of their physiology are they bringing with? How much of the chemistry? How much of the pharmacology are they bringing in? Because essentially all of that should be integrated in a system that they are doing for that week. So if they're doing the ear, for example, then they should have integration here. At the end of that week there should be integration, a clear integration of the anatomy, of their physiology, of their pharmacology, of their chemistry, of identifying the various conditions, managing the various conditions, whether it is drug management or non-drug.

PARTICIPANT 3: And we can even flag, you know, send out reminders. Today you're working at this facility, so for today, focus on, for example, the ear, see how many patients you can see with the ear. See if you can identify ... that we have discussed in class. So ja (*yes*), we can even have per week, we can have a topic per week.

INTERVIEWER: A system per week?

PARTICIPANT 3: Something like that.

INTERVIEWER: What you are saying then and the rest of the group must guide us here, that in one week we do the ear, the next week we do the nose, the mouth and throat.

PARTICIPANT 2: Ear and eye

INTERVIEWER: In one week we do the ear, the eye

PARTICIPANT 2: The lymph nodes

INTERVIEWER: And we do the lymph nodes.

PARTICIPANT 2: We must not forget skin.

PARTICIPANT 2: Skin

INTERVIEWER: Okay, no, no, so we have to divide this into weeks and then there will be a focus on one section for that week. So if we say that we're doing the ear, everything any communication in that week will be around the ear. When we're doing the nose, the mouth and the throat, any discussion that we have with the students in that week will be around the nose, the mouth and the throat. Any conditions around that. And they will know that in the facility that is what they must look out for and when we go to the facility to them that is what we will guide them to look for as well.

PARTICIPANT 1: Do you think it will work?

PARTICIPANT 3: Yes, we can even talk to the sisters.

INTERVIEWER: We will have to.

PARTICIPANT 3: Place them for this week, place them in this clinic, the ear, mouth and throat clinic. So that they can focus on this. And then on class, then we can just discuss. And the

whole week we will be talking to them conditions around the ear or whichever topic will be managed in that week will be discussed. I think it will work.

PARTICIPANT 1: I think the eye, have conditions and you don't get those conditions in one week's time in the eye. The ear, nose and throat is fine. In the Western Cape, we have a lot of ear, nose and throat infections, but the eye specifically I think would not be appropriate to manage in one week's time.

INTERVIEWER: Yes, the focus of this study would be the ear, the nose, the mouth and the throat, including the lymph nodes and the skin. But we will not exclude the eye. Because that's, we have to ensure that the student has a complete integration of the head and the neck at the end of this.

PARTICIPANT 2: But at most of the clinics, they have special dates for eye examinations where they do the diabetics, they have that special eye test. And a lot of the students sit in with those sessions to see how the eye is examined by a specialist. What do they call it when they do that eye examination?

PARTICIPANT 1: It's only the eye examination.

PARTICIPANT 2: That's only the eye

PARTICIPANT 1: But the specific condition, I think stays, different conditions (*voice fading and becoming unclear*).

PARTICIPANT 3: That is all the photos that you post on your device is going to come in handy. So that you can always just tell them these are the signs and symptoms and this is what the condition looks like. So if they don't come across the practice they will have that to link the theory to the practice then.

PARTICIPANT 1: You must also just be aware that they don't just focus on this condition for this week, only ears for this week and in the meantime they do see other conditions that we don't condition too much.

PARTICIPANT 4: I agree. I think we should keep the platform open; not to limit our students to say for example to the ear. Because what was interesting, I have one of the current students is on my Facebook account and I'm just thinking now that we're doing the head and whatever now, but the student were so excited for the first time she posted a status on Facebook, she saw the

tympanic membrane for the first time and she was so excited. And I think that was an opportunity whereby we could've I don't want to say, test her knowledge, but to expand. But what did you see about the tympanic membrane? How did it look? At the same time, her other friends, her colleagues could have learnt from that opportunity. So I think we should not limit our students to lets for example say, the ear for this week because then it means, what if you see something that is very rare as a student want to have a discussion on it?

PARTICIPANT 2: I agree with Participant 4 what he's saying, but they must be aware of the other conditions that they must also learn from. They must be reminded that remember our focus is ear this week. But don't forget that there is conditions that you must also learn off. And then the other thing we must also remember, it's just not ear, nose and throat, what about the examination techniques?

INTERVIEWER: That comes in here as well. That is important.

PARTICIPANT 2: We must inspect, palpate.

INTERVIEWER: Yes, we have to advise them on that. Remember, as much as the time in the clinical facility will be part of the study, the skill laboratory on a Friday will form part of the study as well. Because that is also where we could help them with the integration of the theory and the practice. Because in skills lab, in simulation, we can show them conditions in simulation, we can show them conditions that is being managed at clinical facilities within the Western Cape. We can show them those common conditions that are seen. We can show them pictures of that and we can still guide them with the examination of the ear, the nose or the throat or the mouth for that matter.

PARTICIPANT 2: You can use demonstration.

PARTICIPANT 3: So the device can actually become like a preceptor or something – shadowing us. Shadowing us; not replacing us, but bringing us closer to the student in the clinical facility.

INTERVIEWER: And I think the one thing that one of you mentioned earlier is that you're not always with students, but whether it's Ikamva or whether it's WhatsApp, or whether we use a combination of the two, you will have to decide as a group, whether we can use a combination of the two. It means that if you're at another facility, that student can still communicate with you

and even though if you're at another facility, you can still answer that student and guide that student even though you're not physically there. So which means that there is a continuation of supervision even if you're not even physically in the facility, you can still continue with your clinical supervision of the student.

PARTICIPANT 3: I'm also thinking, if we set up groups then they can actually like peer guidance, they can actually advise each other. Sometimes they are more comfortable to speaking to a fellow student. So we can set that up for them – if it's possible.

INTERVIEWER: Yes. The one thing that we have to decide, we're talking about setting up groups. My question to you is how are we going to set up groups for this study?

PARTICIPANT 3: What we are currently doing in midwifery. We set up groups according to the facilitation where they are placed. So if (*name mentioned was deleted*) and myself, Piet Pompies and ... is placed at Putsonderwater then we form the group. And let's say Jan, Piet and Sarel is at that place, they form a group. And maybe the other group that Jan was in they had more experience or they had more students with ear conditions then I can just contact them and say, okay, we are having this problem. Do you perhaps have any knowledge of this? What did you do? How did you experience this? Something like that within the groups?

INTERVIEWER: How does the rest of the group feel about that?

PARTICIPANT 2: Yes, because when they discuss what they've experienced then they learn from each other.

INTERVIEWER: I think it makes more sense as well to have a group per facility, because as you said, it just creates an awareness for them of and also availability for discussion. Because at the end of the week they must come and present what they've seen for the week in class. And they can help each other that peer assistance, peer facilitation, I think it would work better if we do it that way as suggested, per facility. The only concern is that some facilities might have only one student and that cannot be a group. Or some facilities might have two students and some facilities might have six or four students. So that becomes a challenge.

PARTICIPANT 4: If we're going to have groups, we're not going to share much information. So I think we should rather create one big group for the class, because if I'm in (*facility name removed*) and you are in (*facility name removed*), and you must belong to this one

specific group so that you can learn from the group, because if you have five different groups is it possible for those groups to share outside the groups with the other groups? So that's why I think we should have one group for the class whereby we have different participants. Let's for example, a participant can be a clinic with all the students in and so on. Because we want to share the information at the same time

INTERVIEWER: The only thing is that one of the module outcomes is that they have to do a group presentation for which they get a mark in the primary health care module. So there is a mark for their presentation. So then where do we get the mark from for that presentation? If it's one big group.

PARTICIPANT 4: But remember, you can still see, say for example, say if participant number, if one of the members of the group, I'm actually saying now if one of the members should actually be a clinic. The clinic must belong to lets for example say, the group, then you can still assess the group as members.

INTERVIEWER: But then it still comes down to what Participant 3 said. She said that every facility becomes a group. So even though they will share the information on this one big group platform, essentially you will still see group (*facility name removed*) did that. Group Putsonderwater did that.

PARTICIPANT 4: But you see then you need to go and look, if the three of us is working in (*facility name removed*), why do we need mobile devices? Why do we need to have a mobile device if we can actually discuss among each other?

INTERVIEWER: The mobile device is for the lecturer and the clinical facilitator to help you with the integration of theory and practice. So that they can at any stage when you struggle with your integration, then you can make contact with your clinic facilitator if they are not at the facility. So whether it can be while you are in the facility. It can either be sitting at the hostel and you're struggling with terminology or you're struggling with some physiology of what is happening in the ear, you can communicate with your facilitator or your lecturer.

PARTICIPANT 4: But then if it is only a communication link between the clinical supervisor and a specific clinic, a specific group, will it serve any purpose for the others? Because I'm thinking now, the purpose is to share.

INTERVIEWER: Yes, and that is what will happen.

PARTICIPANT 4: Because yes, it is good, if the supervisor can share with the students at (*facility name removed*), but what about the other students? Because I'm thinking if you're sharing it with the whole class, that specific discussion might stimulate learning to take place to the other groups.

INTERVIEWER: So what you're essentially saying is if we have this open platform, we have a PHG, a primary health care group. And in this group, we will have groups at clinics who will respond and that communicate on this platform, but this platform is visible to everybody. Nobody gets excluded from the platform and that will also help with the integration of theory and practice. I'm with you. I'm with you. Thank you for that.

PARTICIPANT 3: Yes

PARTICIPANT 4: Yes

PARTICIPANT 2: I agree with what you're saying, but we shouldn't just limit the communication with the clinical supervisor and the lecturer and the student, because what about the other students in another group? They can also communicate with each other.

INTERVIEWER: Yes, and that is why Participant 4 suggests that we have an open platform.

PARTICIPANT 2: Yes, I agree.

INTERVIEWER: An open platform where everybody sees what is happening at the different facilities. Nobody is excluded like a little private group and only that group sees what is happening in that group.

PARTICIPANT 3: It will be like a blog. So you can respond if you feel that you have like valuable information to share.

PARTICIPANT 1: That will be great.

INTERVIEWER: If you have a picture to share

PARTICIPANT 3: You can share.

INTERVIEWER: If at some time of the night you discover that you do not understand the physiology of hearing, you can put it there.

PARTICIPANT 3: I'm thinking even in the class also. You know, some of our students who are shy to put up their hands and to pose a question. So I've heard about a lecturer standing with his cell phone in his hand and then there is a certain time that he allows students to pose questions and then he answers as the questions – they can SMS it to him or they can even WhatsApp, and then he deals with whatever comes up.

PARTICIPANT 4: I agree with Participant 3. I'm thinking now we're talking about time. We need to create time for the supervisor, let's for example, say because remember, if the students work eight hours a day we need to cover that student for eight hours where the student is placed. And how are we going to achieve that? You with me, the question that I'm asking? The students is working a full day – eight hours. We do supervision. Are we going to have a plan? Let's for example we say between 9:00 and 10:00, Participant 1 is going to answer the questions, give attention to the students, because remember we need to be there for eight hours a day as well – online. Because otherwise the students are going to post questions, have queries...

PARTICIPANT 3: At 12:00 at night.

PARTICIPANT 4: Ja (*yes*), so we must have definite times within the eight hour schedule to address. Let's for example say, that if we're ten in a group then at least two must be available between 8:00 and 10:00. And then between 10:00 and 12:00 another two so that we can address the issues of the students. So there needs to be someone, because otherwise we're going to miss some of the opportunities that come about.

INTERVIEWER: Can I ask another question on that, because that is very important. We need to have a designated time where the students can contact you and the time, yes, they're in the facility from 8:00 till 16:00. So that will be the best time to do this from 8:00 till 16:00. So while they're there we should be contactable to the students. But what I'd like to ask you is, remember every lecturer and clinical facilitator builds a relationship with their students and they see the academic growth and clinical growth of their students. Do you want to be available for everybody or do you just want to be available for your group that has been allocated for you? If I had been allocated for 40 students for the semester, then essentially, I would prefer to have this open, designated time of communication with my 40 students. So I will create a WhatsApp group for example, with my 40 students. So whatever I communicate everybody sees what I communicate with my students in my group. And essentially, whatever goes onto the blogger or

the communication page that everybody sees, we decide what they put on there and we respond as well. So they see everything that's happening in any case, but when it comes to communication, do you want to communicate with the whole group of students or do you want to communicate with students you have been allocated to you?

PARTICIPANT 2: I would prefer just to focus on my own group.

INTERVIEWER: The other participants?

PARTICIPANT 2: Because otherwise you are going to be too busy if you've got more than the allocated amount of students.

PARTICIPANT 4: I think we should have a schedule to be available for the students, because remember, we are actually working. We are working if we're on the application, whatever application we're going to use – it is official, its work, its working hours. So we need to have a schedule and we need to set time apart to address this. Let's for example say, because if we're only going to focus on 8:00 to 16:00 in the day, what happens when the students go home at night and really reflects on what happened during the day. Because it might be that the clinic was too busy to address that specific issue, but then you can keep it in mind, write it down quickly and tonight you can go and reflect, take out your textbook, make contact with your supervisor and so on. So we need to have time. We need to have a schedule to address those issues. And we need to get the students in that mode if you cannot address something during the day there's a slot, then lets for example say, between 18:00 and 20:00 in the evening, whereby one of us need to be there.

PARTICIPANT 3: I'm really not comfortable with working during the night. That will mean, I mean we've got our personal lives as well. Our working time is from 8:30 until 16:30. We've got things to do. So I think for me, cut off time will be 16:00. Then I need to tend to my personal life as well. So I'm not comfortable with that 18:00 to 20:00 slot. I don't know about the rest of the group.

PARTICIPANT 1: I want to know about when a student asks you a question, are you, this is maybe time management, but I need to know do you need to respond to immediately or what, because you can be in a workshop or in a meeting or whatever when this person asking you about a condition. Do you need to respond immediately? Can you postpone it or whatever?

That's my question. We limit them from 8:00 till 16:00, yes, they are in the facility, are the students entitled to get that answer there and then? You know, we must be aware of what we tell them – the expectations from us and how we are gonna (*going to*) operate this – mobile and answering or whatever – giving back information, because even though we're not there, for sure, we are doing other things. We are in other workshops or what.

PARTICIPANT 2: I think we must just leave that to our own discretion. I mean that we're not going to get immediate answer for this thing. I think we should use our own discretion for this thing.

INTERVIEWER: You can use your own discretion, but I think we need to when we inform them of this and give them guidance on how this is going to work, we need to inform them that you may get an immediate response or you may not get an immediate response and these are the possible reasons why. So we want real-time responses for the students, real-time communication with the students, but you might be driving and you cannot answer at that time. You might be sitting at a doctor's office with your child. You cannot respond at that time, but as soon as you're available to respond to the students. So we can create a scenario to inform students on that, because I think that is important for students to know.

PARTICIPANT 1: And also what is important is that the student must know that he must know his work by heart prior when he's going work into facilities in any case, when he's doing those conditions. It is still his responsibility to know his information and that it's just a help. It's not that I must teach him now from start again and he can use now this WhatsApp or whatever we are going to put in place, as to always just ask me, ask me. And prior he did not do his own studying before he's going to the facilities where he knows that he is doing this conditions at this facility or whatever. So the students must be making aware that it is just a help, it's not like from scratch now you can just ask me any time you want to.

PARTICIPANT 4: I think if we look at our programme, it is impossible for the students at day 1 to know everything. Because our programme is structured in a way, we don't have a block system whereby we expose the students to all the conditions and then the students go and work. So we need to keep the, the students in mind, the student that does not have all the information. Because let's for example say week 1 we introduce history taking, what if something comes out of the history taking? Which does happen.

PARTICIPANT 3: I agree with you.

INTERVIEWER: And remember, our students go into the facilities, they get some theory in class, they get some clinical guidance in the skills laboratory and then they go out to the clinical facility. And essentially, it's almost like they put everything in a little box and they go to the facility with two boxes – they've got the class box and they've got the skills lab box. Now they're in the facility, which creates another box.

So our function and idea of the study is to use mobile devices to help them integrate those boxes, because there shouldn't be any boxes essentially at the end. The integration will help to get them out of the boxes. So you may have a student that understands the full anatomy and physiology of the ear but when it comes to identifying that in clinical practice, they can't. They struggle. They struggle. They see the ear, it's almost like they don't see it as well. So that is where they will need the guidance. To say that this is the theory, this is what the tympanic membrane should look like, what you're seeing at the moment? And from what they see you can help them make a diagnosis. So you're guiding them essentially. And that brings integration. Because now they've learned about the clinical signs and symptoms of otitis media and now they've seen it and now you help them to integrate it.

PARTICIPANT 4: I'm thinking back a few years ago when I was still with the midwifery group. Our students were working night duty, but what happened at that particular time the student was alone with the patient and it was an emergency. What the student did because the student could not find the registered nurse that was working with her, she phoned me. It was past 12:00 and we saved that life of that patient that night, because we've identified what was wrong with the patient. She could have given me the clinical picture and I assisted her, so our students, they does need assistance. I know it's very rare that we won't find a registered nurse with a student, but it was a very unfortunate case, but they do need assistance out of normal clinical hours.

INTERVIEWER: And also, I would agree with Participant 4, when it comes to the whole group, because listening to him makes a lot of sense. Because if we have a blogger where everybody sees everything so as if anyone sees anything in the facilities, then everybody will see it if we have the whole group on WhatsApp. Which then means that we will have to work on a schedule of whose available when and we will have... the students will have to know the

schedule of say, for instance, Mrs (*name removed*) is available from 8:00 till 16:00, just an example. For 18:00 till 20:00, Participant 4 is available. Or for this time period, Participant 3 is available. The students must know who to contact, who will be the contact person.

PARTICIPANT 4: Or at least we should have the schedule whereby the students know this is the time where there will be someone, not necessarily after 16:00. Let's for example, say, our schedule is after 20:00 in the afternoon. That is our schedule and the student knows that is the time when we are active. There will be someone to address an issue. Because it is not nice, the other day, I was on twitter, and this one guy posts a status, he was addressing Cell C, because he had a complaint and for three days he didn't receive any response. I could see his frustration. Because what is the use of the application? Why do you have it then if you don't address your issues?

INTERVIEWER: Okay, can we summarise? Can we summarise? And I need you to help me with the summary. Essentially, we discussed two platforms only – we discussed WhatsApp and we discussed Ikamva as a platform to use to assist us with the integration of the theory and practice of the ear, nose and throat for the students. Do you suggest one or do you suggest a combination of the two?

PARTICIPANT 4: I would suggest that we use both. I think we use both because the other day when we were writing, one of my colleagues she was constantly there. There was a crisis in her year level and she addressed the students' concern via WhatsApp, because it was personal and she managed to address each and every student. So I think we should use both. And WhatsApp, it's basically you're there for your student. And I think you can still decide okay, I'm not going to respond to this now, but eventually, tomorrow morning, I will respond. But with Ikamva I think we need structure. We need to be there because it's like we have a lecture, we arrange a lecture in the class and the lecturer is not there. So I think the same principle goes for Ikamva. We need to be there on Ikamva.

GENERAL NODDING SHOWING AGREEMENT OF PARTICIPANTS

INTERVIEWER: The content, we will give more structure about the content that we want them to focus on. We decided on the groups. We're going to use one platform where everybody will have access to this platform. Everybody will see what is happening. But we're going to ask them to respond in their groups and the groups will be in the facilities where they are placed.

You will have time for the students to communicate with us and we will still have to discuss the after hours time of availability and who will be available for students after hours and we have to ensure that there's a designated time where everybody is available and also that they're comfortable with the time allocated to them. Any questions?

I will transcribe this information and I will send it to all of you because that will also... we're going to have another focus group and it will also help us to inform us on what to focus on in the next session. I'd like to thank everybody for coming and taking time out to be part of this study. I really appreciate your time for coming today. It was storming this morning, yet, you guys were all here. So thank you very much for your attendance and for your participation and I'm looking forward to doing the next focus group with you.

GENERAL RESPONSE BY PARTICIPANTS: Thank you.

(End of audio)



ANNEXURE 20: EXAMPLE OF A TRANSCRIPT – INDIVIDUAL INTERVIEW WITH A STUDENT

Recording details	7110020
Length of recording	12:34 Minutes
Site	University of the Western Cape
Data collector	J. Willemse
Date of data collected	29 November 2013
Transcriber	G. Kassiem

STUDENT INDIVIDUAL INTERVIEW 2

INTERVIEWER: Student, I want to thank you for taking time out to come to this individual interview. Thank you for your consent. You've been part of the focus group discussions that I had with students and the research question that we've discussed there was how do you think the integration of theory and practice of the examination of the head and the neck within the primary health care module could be done using mobile devices? From the focus groups, we concluded the sessions with a method of communication, which was WhatsApp and email. That was the conclusion of that session.

But now I need to ask you, can you give any guidance on how can we integrate theory and practice? A plan how we can do that. You've been exposed to the case-base methodology from the first-year where we prepare cases for you and you work around those cases and you then, in the clinical facility, you then look for relevancy from the cases that we've discussed. How did you experience the case-base methodology thus far? And have to got any advice to give to help with the integration of the theory and practice of this module using mobile devices?

PARTICIPANT: I really enjoyed the case-base methodology because I feel that there's uniformity in it. So everybody gets the same amount of information that we need to work with. Because I feel like if I come with my own and then that person might not... I might have a better

understanding because I actually worked with the patient with whatever the patient may present and the other person would not.

So I feel that there's an advantage and disadvantage if each bring their own case presentation. But I'm not saying that... maybe if you could find something interesting and the patient gives you consent to take a picture and you quickly, like hey, look what I found. And then you ask your class mates and your lecturers via technology, WhatsApp, email, the blog that they started on ikamva, that this is what I've found. Can you guys give me more information as an interest sake?

INTERVIEWER: Can I ask you, if I give you, as a student, say for example, that we are going to do the ear, if I give you a list of conditions around the ear, and I give you a structure of how to write up a case study, with that information, would you be able to go into the facility and look for patients that present with the conditions that I've listed for you? Would you be able to write up the case and then come and present it to the bigger class?

PARTICIPANT: Yes, yes, I'm talking about me now. I think I'd be able to because you do all the observations. So that is a given. But I think we would struggle as formulating questions, because I can write up the scenario, but the formulation of the questions would be tricky for me, I think.

INTERVIEWER: I would ask you to look for a patient with a certain condition and write up the management of that patient with the guidelines that I'm giving you. Remember, we have a format in which we manage a patient in primary health care. So if I give you that guided format, that format as a guidance, and then you find a case that is specific to the system or to the section of work that we're busy dealing with and you write it up. And what you found you come and present in class.

PARTICIPANT: Yes, I think we would be able to do that, because then you have more knowledge. Then it's not just a piece of paper with an imaginary person on it. You actually saw the patient. You actually saw maybe this lesions on the skin. So you would have more in-depth knowledge on the case. It's just maybe with the medication, you will need to go and ... just look that up to see the side-effects, contra-indications and blah-blah-blah. So that would be pretty interesting I think.

INTERVIEWER: And if you have to make a choice between a case that is given to you to work with and a case that you actually bring from the facility that you have worked with, if you must decide which one, which one would you feel, as a student, would be better for you to manage?

PARTICIPANT: The case that I managed, because you'd have more in-depth experience about it. So it would be real if I can put it like that.

INTERVIEWER: And how can using a mobile device help you as well with that integration?

PARTICIPANT: Because it is instant. I can quickly ask you, this is what the patient came with. This is my thought on what might be the problem or query or whatever. And then if you maybe look and you see oh, this is cirrhosis or whatever and you're like it is cirrhosis and those are the clinical manifestations of the problem. So I think that would be fine.

INTERVIEWER: My next question would be if I give you a list of three conditions that are commonly found in primary health care facilities about the ear. I'm just going to use the ear as an example again. Say for example, I'm telling you, you have to look for a patient with a case of otitis media, a case of otitis externa and a case of mastoiditis while you are in the clinical facility. We have a discussion about these conditions in class and then you have to practically go and look for these conditions in the clinical facility and as you said, you can use WhatsApp or you can use email as a method of communication should there be anything that you are challenged with. What if you don't find any of those cases in the facility, what then?

PARTICIPANT: You see that is the problem that I have. There is no uniformity. I might find all three. Somebody might find one. And the other person might find none. And that other person who doesn't find anything, I feel would be disadvantage as opposed to those who did find something. That's why it's an interesting idea and it's fun and exciting, but then again you need to look at, do I go to different facilities? Because some people don't come in. And it is basically, just chronic patients and then you deal with chronic patients the whole day and you don't get anything, how can I put now, related to the illness. So that's why I feel that case-base methodology is better because there's a sense of uniformity. So if you're lost, everybody is lost.

INTERVIEWER: So you feel that reflecting on what we've discussed, having a structured case is better. What about using both?

PARTICIPANT: Yes, we can use both, because then nobody would be penalised, because if you can't find something then you really can't find something. But it's not like you're going to be penalised for it. If that is the case I'm all for it.

INTERVIEWER: Because essentially, if we present a case in class it will be a simulated case. It will essentially become a simulated case. So would you think that discussing this simulated case and bringing some of the real cases into the class, do you think that will contribute to learning?

PARTICIPANT: That would because we're doing it now. Okay, community, we haven't had so much experience. So I'm going to talk about midwifery now. So in midwifery we would discuss a case and then the lecturer would talk about [m]... and I'd be like, oh, when I was in hospital, I delivered a patient and she had Grade 3... and it was right... it looked like pea soup, the smell and all of that. And then you could relate. I think that's what we do now. Even most of the lecturers when they're lecturing, they would go back and oh, when I was in my field, this and this happened to me. So it is personalizing the illness. So I feel that is very good because it helps you link the two.

INTERVIEWER: If you had challenges in, and we did this in the focus group, when you have challenges and there's anything that you have guidance in, the majority of the group said, WhatsApp and email. Will it be comfortable if we use those discussions in class as well?

PARTICIPANT: Yes, because I feel the same way that I felt on the day that I said those things.

INTERVIEWER: Yes, so you will be comfortable, because it means that we can use those discussions in class and we can use those discussions in the skill laboratory as well.

PARTICIPANT: And the nice thing about that is that maybe my view was one-sided and somebody might point it out. Even if whether you name my name or not and somebody might point it out okay, you're right, I didn't look at it from that angle. So somebody might influence my opinion in that way.

INTERVIEWER: So if you should in one sentence or just shortly summarise yourself, which would be the best plan to help with the integration of theory and practice of this module?

PARTICIPANT: I'm a visual person and I'd like to see things practically, because I'm lazy. I'm very lazy to read and I'm lazy to go back on stuff. That's why when I'm in class I always participate. I always listen when I'm in class because I hate going home and study and looking at all these words. That's just me. So I like interactive stuff and I like when things are not boring. If you challenge me, if you engage me, then you have my full attention, because my attention span... I always make jokes and say that I have the attention span of a gold fish, because you can lose me very quickly. So with me, something practical, interactive, I'm yours.

INTERVIEWER: So, you said that for the sake of uniformity, you prefer a case that is presented to you. And when it comes to class discussions you're comfortable with whatever discussions on WhatsApp to be brought into class to also help with the integration of theory and practice.

PARTICIPANT: Because that would be relevant, because whatever I experience in my facilities, might be the topic that we're talking about during the week. So if you talk about the issue and I go like oh, I saw this and the other person, I saw that, but mine was a bit different and maybe the person eardrum burst or something like that.

INTERVIEWER: Okay. Anything else you would like to add?

PARTICIPANT: No, not really.

INTERVIEWER: Thank you for your time. I think this was important for the planning of this module and how we're going to present this specific section of the module that we're going to do. Because as I've said in the beginning in the previous session in the focus group we had when we came to the conclusion of the 'how', what to use, but the plan of how we're going to present this module, I had to ask your guidance in that as well. And that is where we are now. Remember we have structured scenarios, but we also have to explore your views as to what you think would help with the integration of theory and practice using mobile devices as well.

So thank you very much for your time. I will transcribe this interview and ask you to come and have a look at it just to make sure that what is written is what you've said and before I used it for any of my research. Thank you so much for your time.

PARTICIPANT: Pleasure.

(End of audio)



ANNEXURE 21: EXAMPLE OF A TRANSCRIPT – INDIVIDUAL INTERVIEW WITH A CLINICAL FACILITATOR

Recording details	7110012
Length of recording	16:18 Minutes
Site	University of the Western Cape
Data collector	J. Willemse
Date of data collected	29 November 2013
Transcriber	G. Kassiem

INDIVIDUAL INTERVIEW WITH A CLINICAL FACILITATOR

INTERVIEWER: Good morning, as a clinical facilitator, I would like to welcome you to this in-depth interview that we're going to have. We've talked about all the confidentiality surrounding this and anonymity. I will ask you at the end of the interview, once the documents are transcribed to just read and verify that the discussion on paper is accurate. The question to you this morning is, the first thing I'd like to say is that I'd like to talk to you about the project title for my research. The project title is the forms of m-learning for the undergraduate nursing programme, which is a designed-base study. And the question that I'd like to ask you this morning, I'd like to ask you how do you think the integration of theory and practice of the examination of the head and the neck within primary health care can be done using a mobile device? So what I need to know from you this morning is how can we assist students with the integration of theory and practice within this module of the head and the neck, using mobile devices?

PARTICIPANT: Okay. I personally think that using a mobile device for teaching and learning is something very positive, because the students that we have today are students who are more technologically inclined, they're more in tuned with all the apparatus that is used. So I feel we can use that so that they can learn much better. We can use it, especially, with the anatomy and the physiology that the students have already done and on the third-year level where we do the examination of the head and neck, with the ears, the nose and the mouth. We

can use the mobile device as an asset for teaching and learning, because we can post on, I use WhatsApp. We can use email. And with the WhatsApp we can communicate about our content. On email we can always put attachments on the email or short videos or slides about physiology, especially when it comes to the ears. They must know anatomy and physiology, but we've got a problem with our students. Our students tend to when it comes to revision, our students tend to forget what they've learnt. So that means first and second-year's work they forgot. So we must do, before we start with the ears or the nose or the eyes or the mouth, we'll have to do a short revision so that they can come on par with what we want to do with them, especially when we use WhatsApp and email, and we've done a section, if they want to ask a question or have queries, they can send me their queries and I will send it back to them. So that's a good thing that we can use.

But even in the class room our students are connected with the Internet. If they want to know something they can quickly Google, and they can use that opportunity for teaching. For example, when I speak to them about a geographic tongue or I speak to them about any disease on the tongue or the mouth, and they have difficulty in understanding what it looks like. Then I would say let's Google quickly and then we'll show each other the pictures. If they have slides on Google, we will show it to them and they will understand. So they will grasp it much better and then we can go on with the teaching and learning. But for me personally it helps a lot because it makes it easier for the students to understand and it makes it easier for them to learn. When we get to the facility you can incorporate the use of a mobile device when we have sessions for them, because even when we do inspection and palpation we can always go to the Internet and they can read or they can see on a slide how you palpate and then we can start practising, because they've got an idea.

INTERVIEWER: My question to you is, do you have access to the Internet within clinical facilities currently?

PARTICIPANT: No, currently we haven't got access to Internet, but if the students have access to Internet and I have access to Internet then we can use this as an advantage for ourselves. But at the moment we haven't got Internet. So that is a bit of a problem. I'll have to buy bundles or something so that I can help the students. But I don't know maybe that will come right some other time. But it can be used positively. I believe that we must make use of these

opportunities and these devices to encourage our students to be able to learn better. Because we're talking about we want them... we don't want them to just rote memorise stuff. We want them to experience deep learning. So that when they get to fourth-year or they're finished with their training and they get to the facilities, they can still remember what they've been taught. Because in the end we want them to remember what they've learnt.

INTERVIEWER: Participant, you've said in the beginning that there is a challenge with students coming into the third-year and having left their prior knowledge behind when it comes to the anatomy and physiology of the different systems. In which way do you think that should be revised in the third-year, because they do anatomy and physiology from the first-year, in the first-year and the second-year. And in the third-year they are supposed to apply that knowledge that they've learned. So how do you suggest we do that revision? Anything that you can think about that you think will help.

PARTICIPANT: There are other teaching methods that we can use.

INTERVIEWER: But specifically with mobile devices. What can we use, what type of applications on mobile devices can we use to help students with revision?

PARTICIPANT: WhatsApp is one...

INTERVIEWER: In which way can we help them with WhatsApp?

PARTICIPANT: We can post the questions on WhatsApp.

INTERVIEWER: All right.

PARTICIPANT: We can put the pictures on WhatsApp. We can even... the anatomy and physiology, and part of the content that we must do, we can put that on WhatsApp. So that they can just go on WhatsApp and just do some revision. We can use scenarios and put it on WhatsApp so that they can do that on their own – self-directed learning. They can do that on their own.

INTERVIEWER: Do you want these scenarios to become a discussion?

PARTICIPANT: The scenarios can be used as a discussion. The other thing is also what we'd like to do is have a group WhatsApp. Say for instance, my group, I'm doing the primary health care for the third term, so the third term students are all on the WhatsApp group.

INTERVIEWER: In one group?

PARTICIPANT: In one group.

INTERVIEWER: Okay.

PARTICIPANT: So when we send one a message it goes to everybody.

INTERVIEWER: So everybody sees it?

PARTICIPANT: So everybody sees that message.

INTERVIEWER: I've had focus groups with students and one of the main concerns is professionalism – using a mobile device in front of a patient. What is your perception on that?

PARTICIPANT: Okay, that is a bit of a problem nowadays. I feel that if you don't use the patient's face, because we must make use of learning opportunities in the facilities. In the facility, you will see the real thing. And if the patient gives us permission, we're not going to focus on his face. We just focus on the area that we're going to use. But if we use the head, obviously now, the patient's face is going to be there, we must ask the patient's permission. I feel if you work in a clinic and a day hospital, municipality or ..., they must know that every patient that come they must know that this is also a teaching facility. So they can be used to advance learning. But we must get the patient's permission. And if he says it's okay, then why can't we do it, because they do it in the hospital with patients.

The other thing that we can also do is we can use the patient as a case study, because the patient is a case study and that information we get from the patient, can be used to advance all the students. Because the patient can give us feedback and that helps.

INTERVIEWER: So can you use the patient as a case study and that can be broken up and that can be shared among the class to help with learning. Is it a possibility that you are now allowed to, because remember you have permission, whether it is local authority or municipality or a provincial facility, you have to have special permission to take pictures from patients in that facilities, but writing a case study with no names and no folder number, will you be able to guide your students to search for pictures from the Internet of what they've seen?

PARTICIPANT: Of course, yes. Of course, yes we can do that. That won't be a problem.

INTERVIEWER: If you see otitis media in a patient, the students can see all that. You can look for pictures with otitis media and attach that to the case study.

PARTICIPANT: Yes, if you can do that it would be very nice. It would really help the student to understand how everything links together – your anatomy and your physiology of your first and second-year and your third-year things where you must use case studies and you must know content, and where you must be able to examine and be able to determine normal and abnormal. It would help a lot. It would make it very easy for the transition of the students' learning.

INTERVIEWER: Is there any other way that you think that we can use the mobile device to help the students with the integration of theory and practice? You've mentioned WhatsApp and you've mentioned email. You even mentioned searching the Internet, like Google searches, find appropriate pictures that are relevant to cases that you are busy with. Are there any other methods that you think we can use to help students with the integration of theory and practice?

PARTICIPANT: You can probably also use blogger. You can probably use blogger.

INTERVIEWER: My concern with using blogging is that with the survey that we did with the students, 65% of them indicated that they do not use blogging. So that means only 35% use or don't know what blogging is. So that becomes a challenge.

PARTICIPANT: Then you must use the... we must use email and WhatsApp. I think that would be better.

INTERVIEWER: Have you used WhatsApp before?

PARTICIPANT: Yes.

INTERVIEWER: Did it work for you? How did you use WhatsApp before?

PARTICIPANT: I used WhatsApp as a communication medium for my students.

INTERVIEWER: And what did you communicate with your students?

PARTICIPANT: I communicate any queries that they have. They will send it to me. And also to communicate to them about if I'm sick or I will not be able to get to them. Or they will indicate to me that they will not be at the facility. Maybe they're sick. So that makes it easier for me and it helps me because then I don't need to go to the facility and there's nobody. And

WhatsApp is also an application that they don't pay for – it's free. So it's applicable for the student. You know students is all, 'we never got money'.

INTERVIEWER: Coming back when you said you shared course content with them as well on WhatsApp.

PARTICIPANT: Yes.

INTERVIEWER: Were they able to use questions?

PARTICIPANT: Yes.

INTERVIEWER: Using WhatsApp, did that improve their understanding of what they were busy working with in the clinical practice?

PARTICIPANT: Definitely. Definitely, because some students will not understand something while you're explaining something and they don't want to ask you questions. Because maybe you must go to a next facility and then when they get home they will send you that query. Then you are able to answer and bring clarity to what they are struggling with.

INTERVIEWER: Thank you very much, that has been very helpful. And I'm sure this information will really guide this study. Is there anything else that you would really like to add?

PARTICIPANT: Anything else that I would add? It would be nice if every student will have their own, what do you call it, laptop if they could make use of their own laptop and iPads, it would be such a help, even the clinical supervisors, if they each have their own... I remember when there was a student in our group that had a iPad and we had a query about a condition and she would go to Google quickly and she could share information with everybody. And then you could see the light bulb going on with each and every student because they could understand because of the pictures that they saw. So it would be a good thing if they could have their own laptops or if, not laptops, iPads, if it could be available in the skills lab, oh, that would be nice. Most definitely it will help us with teaching and learning.

INTERVIEWER: (*name removed*), I understand that it can help with teaching and learning, but we do understand the constraints...

PARTICIPANT: I understand...

INTERVIEWER: The financial constraints and supplying iPads to all the students. I thank you.

PARTICIPANT: But iPads can be available in the skills lab to be used. They don't need to take it home. But it can be used as part of teaching and learning.

INTERVIEWER: I value that. I thank you for that input. Anything else you'd like to add?

PARTICIPANT: No, I don't think so.

INTERVIEWER: I'd like to thank you for your time. Thank you very much for your time. And as I said, at the start of this session, this interview will be transcribed and the information will be made available to you to verify before I use it for the study. Thank you very much for your time. It is appreciated. Thank you.

PARTICIPANT: No problem.

(End of audio)



ANNEXURE 22: EXAMPLES OF ELECTRONIC REFLECTIONS FROM STUDENTS

1st ITERATION

RE:Reflection on ear,nose and throat

2 messages

 <@myuwc.ac.za>
To: jjwillemse <jjwillemse@uwc.ac.za>

Mon, Apr 25, 2016 at 2:32 PM

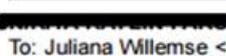
Good day Mam

At first I found it challenging to integrate theory into practical..but I enjoy this method of learning,it kept me on my toes in the clinical facility and learning at the same time.I was under the impression we would only do one task on one of the two days that we are in clinical facility so i was not very prepared for the second task handed to us on the thursday.The video ended up to be a lot of megabytes in the end we had to decide among the group who was going to send it,the break times we get is not enough to do the amount of tasks we had complete,the staff was very accommodating towards the task we had at hand but all in all I enjoyed the challenge and learning experience.

2nd ITERATION

Reflection

1 message

 <@myuwc.ac.za>
To: Juliana Willemse <jjwillemse@uwc.ac.za>

Thu, Apr 28, 2016 at 9:27 AM

Good Morning.

I am sending this email as my reflection of week one - The ear.

I myself found the activities to be very useful and helpful as well as informative as these activities gave me a clearer understanding of what is being dealt with on a daily basis within the clinical setting. However, some times we experienced signal problems at work and not everyone had data so it caused somewhat confusion and chaos as we had to work from one - two phones per activity. Not all of the group members were as willing to part take in the activities especially the video. Unnecessary arguments/Disagreements came up as some did not want to be in the video.

Furthermore this learning opportunity was a good way to interact with peers and show who understands what, in their own way and therefore everyone could learn.

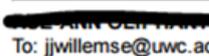
Kind Regards



3RD ITERATION

REFLECTION : MOUTH AND THROAT

1 message

 <@myuwc.ac.za>
To: jjwillemse@uwc.ac.za

Fri, May 20, 2016 at 4:15 PM

 REFLECTION- mouth and throat.docx
11K

REFLECTION (Continue)

MOUTH AND THROAT: TUTORIAL

NAME:

STUDENT No.:

This tutorial has really been an interesting and knowledgeable one. It helped me with unanswered questions. Offered me an opportunity to challenge myself and try and answer the questions to the best of my ability. Being able to understand diseases and abnormalities of the mouth and throat made it easier to diagnose patients and manage their condition. Working with my fellows peers was an interesting experience. It was good to see students from various facilities providing information related to the mouth and throat and how they would investigate. I can now distinguish between the normal and abnormal findings. Doing it with the WhatsApp group brought so much clarity and what is expected during the investigation. I feel confident about this clinical examination and will execute with excellence.



UNIVERSITY *of the*
WESTERN CAPE

ANNEXURE 23: 2016 PRIMARY CARE AND CLINICAL SKILLS MODULE

SCHOOL OF NURSING

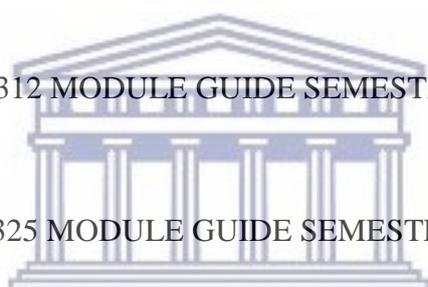
COMMUNITY HEALTH NURSING

2016

COURSE: PRIMARY CARE AND CLINICAL SKILLS

CUR 312 MODULE GUIDE SEMESTER ONE

CUR 325 MODULE GUIDE SEMESTER TWO



UNIVERSITY *of the*
WESTERN CAPE

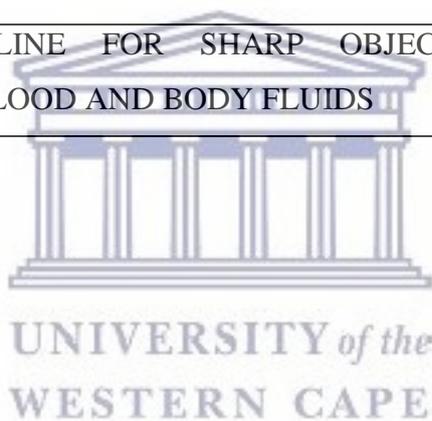
LEVEL: 3rd YEAR

NAME:

STUDENT NUMBER:

Lecturers		Office	Contact
Clinical supervisors			
Administrative staff			

TABLE OF CONTENTS		PAGE
	Part A. General Information	3
	Teaching Staff and Contact Times	4
	Module Overview	4
	Part B. Teaching and learning	6
	Teaching and Learning activities	6
	Module Schedule	9
	Materials	10
	Graduate Attributes, Learning outcomes and Assessment	12
	Evaluation of the learning and teaching	17
	Part C. General Information	
	Academic Honesty	47
9.	POLICY GUIDELINE FOR SHARP OBJECT INJURIES OR EXPOSURE TO BLOOD AND BODY FLUIDS	49



PART A. GENERAL INFORMATION

Welcome to the module: Community health nursing

The focus of this module is the primary care and clinical skills of common conditions in Primary Health Care (PHC) nursing practice. As a student, it is important for you to understand the responsibilities and tasks carried out in a PHC facility. Your growth and development in PHC practice will be achieved in collaboration with the academic team at ... and the multidisciplinary health care team at the clinical facility. It places you, the student at the centre of the learning process. You remain responsible and accountable for your own learning.

You must utilize your knowledge acquired in the medical/surgical and medical biosciences modules. Knowledge of these modules is required to assist you with the health assessment of the patient, which includes the following components:

- history taking of the patient
- performing a physical examination and to
- respond to the client's needs and
- evaluate the effects of nursing care, rendered.

You are encouraged to develop an enquiring mind and to use every opportunity to increase your knowledge, competence and skills. Utilize every teaching and learning opportunity in the skills laboratory and the clinical placement facilities.

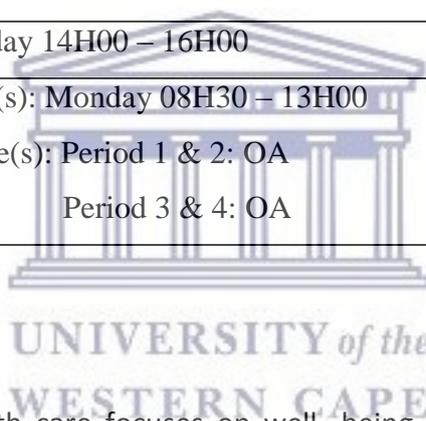
Any queries regarding your academic work should be addressed to your lecturer and if she is unable to help, you should then approach the third-year level coordinator. Please assist the coordinator by putting any complaints in writing and keeping a careful record of dates, times, and persons involved. It is very hard for the coordinator to take action unless she has a detailed record of events in written form.

TEACHING STAFF AND CONTACT TIMES

Module Coordinator:

Clinical Coordinator:

Name	
Room and building	Community Health Sciences, School of Nursing
Phone number	
Email	
Consultation hours	Thursday 14H00 – 16H00
Class times	Time(s): Thursday 08H30 – 13H00 Venue(s): Period 1 & 2: OF Period 3 & 4: OF
Name	
Room and building	Community Health Sciences, School of Nursing
Phone number	
Email	
Consultation hours	Monday 14H00 – 16H00
Class times	Time(s): Monday 08H30 – 13H00 Venue(s): Period 1 & 2: OA Period 3 & 4: OA



MODULE OVERVIEW

Comprehensive primary health care focuses on well-being and the promotion of healthier lifestyles for the prevention of diseases and the rehabilitation of people after an injury or illness.

The health assessment of the client is a fundamental skill and an essential competency of nursing education and a component identified within Regulation R425 of 22 February 1985 (SANC), as amended. The assessment of the patient provides baseline data, which is the foundation on which you as a nurse, will base your interventions, decisions, and evaluations.

You should acquire and be able to demonstrate the following personal, professional and academic characteristics:

- The awareness of one's own limitations and the need to seek help where necessary

- Willingness to be self-critical and to develop the capacity for self-evaluation.
- Traits such as: integrity, empathy, caring, compassion, patience, cultural and gender sensitivity.
- Acceptance of diversity, respect for patient's dignity, privacy and confidentiality.

MODULE DESCRIPTOR

Home Department	Nursing
Module Topic	Primary Health Care and Clinical Skills
Generic Module Name	Community Health Nursing 312/325
Alpha-numeric Code	New
Credit Value	15
Duration	Semester
Proposed semester/term	Semester
Programmes in which the module will be offered	Programme
Level	7
Main Outcomes	<p>At primary level of care a student should be able to:</p> <p>Demonstrate an understanding of conducting a history taking, specific to certain systems of the body.</p> <p>Demonstrate an understanding of the techniques involved of conducting a physical assessment.</p> <p>Demonstrate the ability to identify the difference between normal and abnormal conditions.</p> <p>Demonstrate an understanding of the management objectives for common conditions.</p> <p>Display a basic understanding of the Anti-Retro Viral Treatment Protocols.</p>
Main Content	<p>Integrated assessment, diagnostic and management skills with regards to endemic conditions related to all body systems.</p> <p>Provincial Health Plan 2010 and the role of the primary health care nurse in context of the National Health Act.</p>

Pre-requisite modules			
Co-requisite modules	Community Health Nursing 311/324		
Prohibited module combination	None		
A. Breakdown of Learning Time(<i>example</i>)	Hours	B. Time-table Requirement per week (<i>example</i>)	
Contact with lecturer / tutor:	28	Lectures p. w.	2
Assignments & tasks:	21	Practical's p. w.	4
Practical's:	56	Tutorials p. w.	0
Tests & examinations:	3		
Self-study	42		
Other: Please specify			
Total Learning Time	150		
Methods of Student Assessment	Summative 40% Continuous Assessment 60%		

PART B. TEACHING AND LEARNING

TEACHING AND LEARNING ACTIVITIES

In this module, the teaching staff will act as your guides/mentors in the process of learning. They will assist you to engage with the learning material and to master the new knowledge and skills. We will follow a student-centred, self-directed, case-based approach in which you will be required to engage actively in the classroom /skills laboratory sessions. Group work and discussions will help you to apply the theory in practice and to develop critical thinking and problem-solving skills.

Case-Based Learning

THE PURPOSE OF THE CASE-BASED APPROACH IS:

It promotes creative learning through active participation

Realistic application of Theory to Practice and Skill Development

Promotes experiential learning which answers the what, how, when, why, where etc. which promotes an enquiring mind.

It promotes communication and interpersonal skills, building self-confidence.

Provides an opportunity for risk taking in a structured, supportive learning environment.

Promotes objective thinking in solving problems.

DEFINING CASE-BASED LEARNING

It is experiential learning which provides an opportunity for students to actually experience a situation (real, fictional or semi-fictional) without actually going through the experience and make decisions about real-life situations in a systematic and analytical manner. Risk situations involving patients are reduced while the benefit in solving the situation is an interactive learning experience.

A case describes a situation about what patients have said, experienced, their perceptions, values and judgements. Cases are incomplete by design. This is deliberate to elicit critical and creative thinking, active brain storming, and interactive participation within groups of learners searching for answers to arrive at the most amicable solution through the process of reasoning and active learning.



STEPS IN CASE-BASED LEARNING AND PRESENTATION:

REVIEW THE CASE

Read the case – highlight key words

What are the key issues of the case? What is unique/ universal about the case?

Are there any hidden issues?

Timing is crucial in the solution of the case. Start working well before the due date.

This process takes time if you want to want to thoroughly analyse the what, where, when, why, who and how of the case.

DATA GATHERING

The learner must extend beyond the boundaries of his/her current knowledge. This requires reference reading from prescribed references, other books, articles, expert opinions, internet searches, research articles and reports etc.

Answer the basic issues of the case. What are the priorities of the case? What are the consequences of each solution you have reached?

ANALYSIS OF THE SOLUTIONS

What is the best solution –provide criteria for action of both positive and negative solutions

What alternative solutions are viable and applicable to the case under study?

What support is available

What are the socio-political and economic implications of each solution?

PRESENTATION OF FINDINGS

Prepare for presentation –review the process of solving the problem/review alternative solutions.

Identify the presenting problem

Analyse the solutions/alternative solutions to the problem

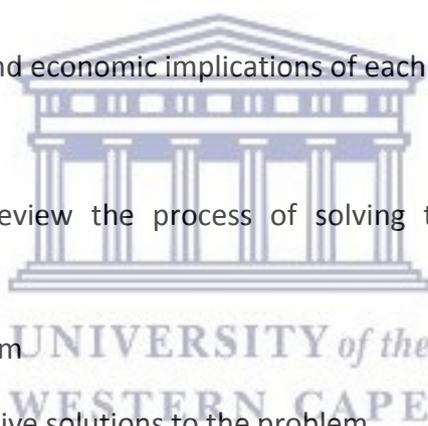
Recommend action plan

Assess whether presentation answers the problem identified and amicable, reasonable, realistic solutions have been found.

Be innovative in your presentation/or group presentation.

CLINICAL SKILLS DEVELOPMENT**INTRODUCTION**

Clinical skills form the basis of nursing practice. Students need to take an active part in the development of these skills and they need to make use of the learning opportunities within the clinical skills laboratory. It offers the student the opportunity, removed from real life situations,



to practice a skill until he/she feels competent enough to be able to care for a patient effectively. This will promote the integration of theory and practice and lead to independent functioning within the clinical units.

SKILLS TRAINING

Aim of Skills Training: is to ensure that the student is competent to:

Assess the specific needs of the individual, taking into consideration his/her basic needs, age, culture and level of knowledge

Plan and prioritize interventions and appropriate referrals, Implement the plan

Evaluate the effectiveness of the intervention strategies

Communicate the outcomes of interventions by keeping accurate records and making appropriate referrals

Use all contacts with the individual in order to develop sound interpersonal relationships

Function within his/her scope of practice and know the individuals' basic human rights.

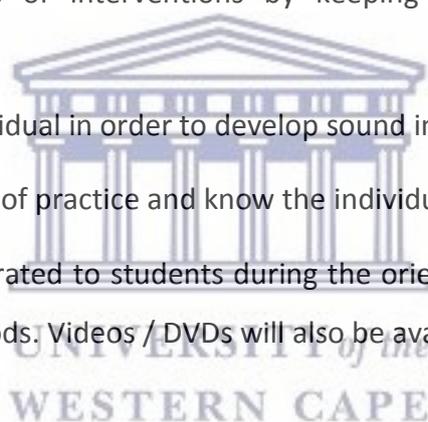
Clinical skills will be demonstrated to students during the orientation period as well as during the skills training lecture periods. Videos / DVDs will also be available in the skills laboratory

Skills Evaluation

The evaluation of clinical skills is an on-going process. Specific skills need to be developed at third-year level. The mastering of these skills in "real life" will depend on the placement of students. It is therefore the student's responsibility to accommodate the development of clinical skills within their academic programme.

Skills Mastering

Students will have the opportunity to rehearse their practical skills during the abovementioned periods but are expected to keep record of their rehearsals whether it was done under the direct supervision of their peers, ward staff, clinical supervisors or any other person who have mastered the specific skill. Students are encouraged to master clinical skills by using the self-

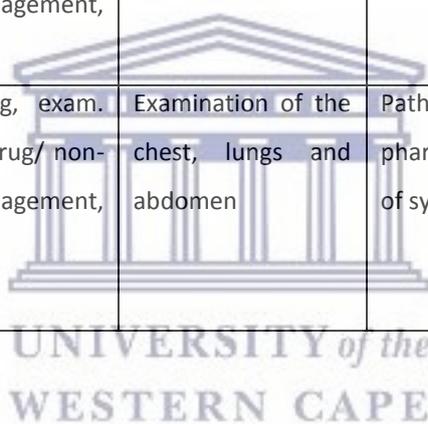


directed learning approach. The clinical lab will be available for supervised / unsupervised practice.

MODULE SCHEDULE

<p>Orientation on-campus 80 clinical hours</p>	<p><u>Skills lab activities</u></p> <p>Preparation for the physical examination (patient, environment, student, equipment)</p> <p>4 Cardinal examination techniques: (inspection, palpation, percussion, auscultation)</p> <p>Health assessment: Preparation, Vital signs, Observe physical and emotional appearance, principles of examination</p> <p>History taking JACCOLD</p> <p>Examination of the lymph nodes of the head & neck</p> <p>Investigations Making a nursing diagnosis</p> <p>Management objectives (drug and non-drug treatment (health promotion activities)</p> <p>Referral to prevent complications</p>					
<p>40 clinical hours</p>	<p>Orientation at clinical facilities</p> <p>History taking (TB, HIV/AIDS, STI's, Family planning and conditions of the skin and head & neck (eyes, ears, nose & sinuses and mouth & throat)</p> <p>Physical examination (Examination of the integumentary system, eyes, ears, nose & sinuses, mouth & throat)</p>					
WEEK	Topic	In-class teaching & learning activities	Skills lab teaching + learning activities	Out of class preparation	Assessment due date	Assessment return date
Week 1	Integumentary system	History taking, examination techniques, drug/ non-drug management, referral	Examination of the skin, hair and nails	Pathophysiology pharmacology of system	Group presentations	Feedback and guidance given in class

Week 2	Head & Neck conditions	History taking, examination techniques, drug/ non-drug management, referral	Examination of the eyes and ears	Pathophysiology pharmacology of system	Group presentations	Feedback and guidance given in class
Week 3	Head & Neck conditions	History taking, examination techniques, drug/ non-drug management, referral	Examination of the eyes and ears	Pathophysiology pharmacology of system	Group presentations	Feedback and guidance given in class
Week 4	Respiratory System	History taking, examination techniques, drug/ non-drug management, referral	Examination of the nose, sinuses mouth & throat	Pathophysiology pharmacology of system	Group presentations	Feedback and guidance given in class
Week 5	Gastrointestinal and reproductive system	History taking, exam. techniques, drug/ non-drug management, referral	Examination of the chest, lungs and abdomen	Pathophysiology pharmacology of system	Group presentations	Feedback and guidance given in class



RESOURCE MATERIALS

Department of Health. 2015. *Sexually Transmitted Infections. Management Guidelines 2015*. Adapted from: *Standard Treatment Guidelines and Essential Drugs List PHC*. Pretoria: Republic of South Africa.

Directorate: TB DOTS Strategy Coordination. 2014. *National Tuberculosis Management Guidelines 2014*. Pretoria: Republic of South Africa.

Jarvis, C. 2014. *Physical Examination & Health Assessment*. 6th ed. Saunders: Elsevier.

National Department of Health. 2014. *Standard Treatment Guidelines and Essential Medicines List*. Pretoria: National Department of Health (RSA).

National Department of Health. 2012. *National Contraception Clinical guidelines. A companion to the National Contraception and Fertility Planning Policy and Service Delivery Guidelines*. Pretoria: Republic of South Africa.

National Department of Health. April 2015. *National Consolidated Guidelines. For the prevention of mother-to –child transmission of HIV (PMTCT) and the Management of HIV in children, Adolescents and Adults*. Pretoria: Republic of South Africa.

Viljoen, M & Sibiya, N. 2009. *History Taking and Physical Examination*. Cape Town: Pearsons Education.

Western Cape Department of Health. 2015. *Practical Approach to Care Kit*. Cape Town: University of Cape Town Lung Institute.

The Open Medicine Project mobile apps:

National Department of Health: Republic of South Africa, Primary health care clinical Guide 2015

National Department of Health: Republic of South Africa, HIV Clinical Guide 2015

National Department of Health: Republic of South Africa, TB Clinical Guide 2015

FIND TB Guidelines 2015 (GeneXpert support app)

MSF Guidelines 2015

MODULE SCHEDULE

Types and due dates of assessment

	Tasks	Total	Weighting relating to task	Submission date
Formative Assessment	Test	50%	50	Week 4 of the term
60% (100)	Portfolio: Evidence of clinical learning and PHC tutorial Case presentation	50%	30 20	By the end of Week 5 of the term

Summative Assessment 40% (100)	Theory examination	50%	20	May/June Exam period
	Clinical examination	50%	20	May/June Exam period

**B Nursing 111 - COMMUNITY HEALTH NURSING
CLINICAL HOURS 2016**

SEMESTER 1				
JANUARY ORIENTATION	TERM 1	Orientation for Term 2	TERM 2	JUNE - VAC
PHC/NRS Orientation Period: 120 Hours (80 hours on-campus and 40 hours block in the clinical facilities) Total hours = 120	CUR 312/ NRS 324 clinical placement hours: 2 days per week (16 hours) X 5 weeks = 80 hours	NRS/PHC Orientation Period: <i>Week 1-3 of Term 2</i> 112 Hours (72 hours on-campus and 40 hours block in the clinical facilities) Total = 112 hrs	NRS/PHC clinical placement hours: <i>Week 4-8 of Term 2</i> 2 days per week (16 hours) X 5 weeks = 72 hours (X1 PH per group)	Group 1: Clinical Placement: 8 hours daily X 11 days (Monday to Friday) = 88 hrs Group 2: Clinical Placement: 8 hours daily X 11 days (Monday to Friday) = 88 hrs
	Skills lab = 5 days X 2 hrs = 10 hrs		Skills lab = 5 days X 2 hrs = 10 hrs	
	Group 1: Community Project = 1-day (8 hrs) x 5 weeks = 40 hours		Group 2: Community Project = 1-day (8 hrs) x 5 weeks = 40 hours	
	Group 1: 130 hrs Group 2: 90 Hrs		Group 1: 82 Hrs Group 2: 122 hrs	Group 1: 64 Hrs Group 2: 64 Hrs
GRAND TOTAL HOURS FOR SEMESTER 1 = GROUP 1 = 508 / GROUP 2 = 508				

CUR 312 / NRS 313 Semester 1:

Group 1: 100% = 444 hour minus week 6 & 7 of Term 2 (52hours) 80% for Group 1- 313

Group 2: 100% = 444 hour minus week 6 & 7 of Term 2 (36 hours) 80% for Group 2- 326

Description and explanation of assessment activities

Feedback on assessment: Special Considerations and additional assessments

Continuous Assessment

According to rule A.5.2.16 of the general calendar, a student may request to resubmit an assessment which counts towards his/ her continuous assessment provided that he/she makes the request in writing to the departmental chairperson within 5 working days of the return of the assessment.

The written request must clearly state the reason why the student thinks he/she deserves a second opportunity to submit

The student may only be granted one opportunity to resubmit an assessment per module

The maximum mark that can be awarded for a resubmitted assessment is 50%

According to rule A.5.2.17 of the general calendar, a student may request a review of a mark received for an assessment counting towards his/her continuous assessment, provided that he/she makes the request in writing to the departmental chairperson within 5 working days of the return of the assessment.

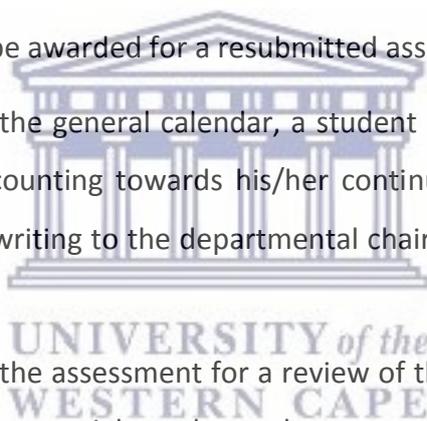
The student may only submit the assessment for a review of the mark once and no alterations or additions to the assessment material may be made.

Final Assessment

Students must obtain a minimum of 40% in the continuous assessment in order to be allowed to write the final assessment (Rule A.5.2.3)

If a student wishes to contest his/her continuous assessment mark, he/she must do so in writing before the final assessment is written. He/she then will be permitted to write the final assessment but will only be awarded the marks for the final assessment if the continuous assessment is found to be above 40. (Rule A.5.2.3 (e))

A student will be granted opportunity to write a re-evaluation under the circumstances specified in rule A.5.2.6



A student who has been prevented from writing the examination due to illness or any other special circumstance as specified in rule A.5.2.8 (a) may apply for permission to write a special examination.

The student must apply for permission to write the special examination within 5 working days from when the examination was written. Documentary proof must be attached to the application (rule A.5.2.8 (e))

Please see Rule A.5 as stipulated in the University Calendar

Promotion rules: ... University Calendar 2016

In order to promote to the 4th / 5th year level:

J.90.3.2 ‘The student shall provide proof of clinical hours as calculated per semester for the year level. In addition, proof of completion of all clinical hours of the second/ third-year must be provided.

J.93.5 ‘No students will be admitted to the final assessment of any year level unless 80% of the specified clinical hours have been completed by the deadline for the announcement of continuous assessment marks for the semester / year’

Please also be careful not to forge as these hours will be placed under strict scrutiny before they are captured.

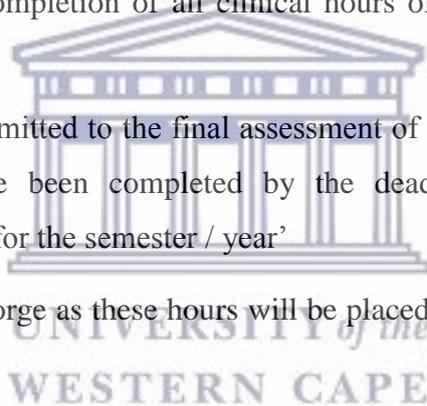
Abide by the following rules to ensure optimum learning in the classroom:

Attendance and active participation in class is expected of all students. This rule is for your benefit as this is the best way to ensure optimum learning and performance in the module.

Please arrive on time for classes. If you are unable to do so, you are expected to enter the class quietly and not disrupt your fellow students. Cell phones should be off during classes.

If you are unable to attend class, it is your responsibility to find out what you have missed and catch up this work. If there is something you do not understand you may ask your lecturer, but you are expected to make an effort to go through the work before you consult the lecturer.

You are expected to hand in all assignments on the given due date. If you have a valid reason why you are unable to do so, you are expected to speak to your lecturer and make



arrangements with him or her for a later submission. If you have not done this, late assignments will be penalised by a 5% deduction per working day.

All assignments and presentations must be written in your own words and appropriately referenced. Plagiarism and any form of dishonesty will not be tolerated. Cases will be referred to the proctor for disciplinary action.

If you are sick on the day of a test, you are expected to hand in your sick certificate within 5 working days after the date of the test.

If you are sick for an examination, you are also required to apply for a special assessment within 5 working days of the missed examination. This involves completing the required form from faculty, attaching your certificate and giving the form to your lecturer to sign.

Evaluation of the learning and teaching on the module



WEEK 1: THE INTEGUMENTARY SYSTEM

SCENARIO: A 35 year old male presents at the PHC facility with a complaint of ‘blisters with crusting in a band along the one side of his body’. The blisters were first noticed by the patient 3 days ago. He informs you that it is very painful and he thinks that it is getting worse as the blisters also appear around one of his eyes. The patient also tells you that he has some swelling under the arms, but it strange to him that the swelling is not sore. He mentioned that he only has one girlfriend and they only use condoms sometimes.

WEEK 2: HEAD AND NECK

SCENARIO 1: A female patient comes in complaining of itching, red and painful eyes with a swelling of the eyelid. It feels like she has grains of sand in her eyes. The past 3 days her eyes are very sticky on waking in the morning. On examination the following was identified: Temperature: 36.5 degrees Celsius, Pulse 70 per min, Respiration 22 breaths per minute, Blood Pressure 122/84.

SCENARIO 2: Teddy, a 26-year-old male, college student presents at the primary care clinic complaining of a blocked nose, purulent nasal discharge and a headache which becomes worse on bending forward for 5 days. He mentioned that he has been to the clinic with the same problem, frequently for the past year. Teddy’s HIV status is unknown and he has a penicillin allergy. Findings on examination: both his sinuses are tender on palpation. On examination the following was identified: Temperature: 38.9 degrees Celsius, Respiration 22, Pulse 83: Blood Pressure 120/86.

WEEK 3: HEAD AND NECK

SCENARIO 1: A 35-year-old known HIV positive patient presents at the facility complaining of a painful mouth and thick white spots in his mouth. On examination: Temperature: 37 degrees Celsius, Respiration 18, Pulse 83: Blood Pressure 120/86. On inspection: observed thick white patches in the mouth, when scratched it bleeds.

SCENARIO 2: Mrs Le Roux comes in complaining of a very painful throat. On examination

Temperature: 38 degrees Celsius, Pulse 87 beats per minute, Blood pressure 110/80, Respiration 18 breaths per minute. On inspection: tonsils red and enlarged with red with white patches on

On palpation: swelling both sides of neck

WEEK 4: THE RESPIRATORY SYSTEM

SCENARIO 1: A 30 -YEAR- OLD FEMALE ARE SEEN AT THE PRIMARY CARE CLINIC. SHE HAS BEEN DIAGNOSED WITH PULMONARY TUBERCULOSIS ONE MONTH AGO AND IS CURRENTLY ON ORAL TB DRUGS REGIMEN 1. SHE INFORMS YOU THAT SHE DOES NOT ALWAYS TAKE HER MEDICATION REGULARLY, AS SHE MUST ALSO REMEMBER TO USE HER ORAL CONTRACEPTIVES. SHE IS SMOKING AND OCCASIONALLY USES ALCOHOL BEVERAGES.

SCENARIO 2: Ronny, a 17-year-old school boy gives a history of feeling unwell and losing weight for the past 2 months. He also complains of a chronic cough and blood-stained sputum. His father was treated for Tuberculosis 3 months ago but stopped his treatment because he was feeling well. He remained well for a while but is coughing again.

SCENARIO 3: A 62-year-old female presents at the health facility with has a history of coughing, difficulty in breathing and tightness of her chest which is worse at night. She has been smoking for ±20 years and has allergies. On inspection you observe chest in- drawing and on auscultation she has an audible wheeze.

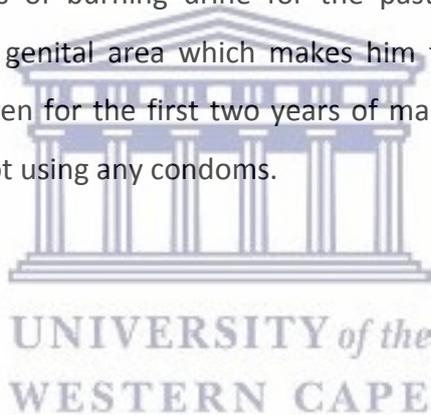
SCENARIO 4: A 43-year-old male attends the Primary Health Care Centre suffering from dyspnoea. He works as a brick layer on a building site. On auscultation of the lungs he has an audible wheeze on expiration and he does not appear to be overusing the accessory muscles of respiration. He has been diagnosed with asthma for which he uses a salbutamol inhaler. His radial pulse is strong, regular at 110 beats per minute and respiratory rate is shallow, rapid and regular at 24 breaths per minute.

WEEK 5: GASTROINTESTINAL SYSTEM AND SEXUAL AND REPRODUCTIVE HEALTH

SCENARIO: Bessie, a 19-year-old female, presents at the PHC facility with a complaint of severe persistent right sided abdominal pain. She also complains that she is experiencing nausea and vomiting. Her temperature is 38°C.

SCENARIO: Bronny, a 39-year-old female is seen at the clinic with vaginal discharge syndrome. She has more than one sexual partner and expresses some interest in having an HIV test done.

SCENARIO: Rina and Ben, an engaged couple, attends the clinic to discuss contraception. Rina informs you that she had a regular 4-day menstrual cycle since age 13. She started her menstrual cycle a day ago. On her last visit to the clinic she presented with tonsillitis and her blood pressure has been elevated with a reading of 150/90mmHg. Today her Blood Pressure is 140/90mmHg. Ben complains of burning urine for the past two days and he observed a yellowish discharge from his genital area which makes him feel uncomfortable. The couple does not intend having children for the first two years of marriage. None of them have ever had a HIV test and they are not using any condoms.



ASSESSMENT TOOL FOR CLASS PRESENTATIONS 2016

System/condition presented:

Names of group members:

.....

.....

	Criteria	0	1	2	3	4	5	Comments
1	Discuss the introduction to the topic							
2	Displays knowledge related to the body structure presented: Describe the anatomy involved							
3	Discuss the pathophysiology of the condition							
4	Discuss history taking related to the scenario							
5	Description & interpretation of signs/ symptoms							
6	Discuss the cardinal examination techniques							
7	Principles of examination of structure examined							
8	Findings of cardinal examination techniques: Discussion of inspection results							
9	Discussion of palpation results							
10	Discussion of percussion results							
11	Discussion of auscultation results							
12	Discuss investigations performed & findings							
13	Making a nursing diagnosis							
14	Referral to: multidisciplinary team in facility							
15	Community referral services							
16	Discuss the management objectives							
17	Describe the drug treatment/management							
18	Health education/promotion activities							
19	Referencing (included/accurate)							
20	Turn it in report							
	Total	/100						

COMMENTS:

.....
.....

Name and signature of evaluator: Date:

Name and signature of students: Date:

GROUP PARTICIPATION/PEER ASSESSMENT FORM FOR CLASS PRESENTATIONS

Group no..... Date:

System Presented:

Group Norms

(Student Name & Student No)	(Student Signature) I hereby accept these norms:
---	--

Group Presentation Attendance Register

Student name	Student number	Meeting 1	Meeting 2	Meeting 3	Meeting 4

Group Presentation Allocation of Roles and Responsibilities

Student name	Student number	Student role / responsibility	Student signature (I hereby accept this role)

Contribution: 5 = Excellent; 4= Very Good; 3 = Good; 2 = Below Average; 1= Poor; 0 = No contribution

Name	Student no	Attendance	Completion of tasks	Punctuality	Effort	Total

2016 PRIMARY HEALTH CARE CLINICAL OBJECTIVES

Health assessment of clients

UNDER SUPERVISION, the student should be able to:

Communicate effectively, clearly and courteously, both verbally and in writing, with patients and their families and with other health professionals

Conduct a health assessment: history taking and physical examination of the client

Practice the ACTS method of HIV testing and counselling

Make a nursing diagnosis

Develop a management plan, including appropriate referrals and health promotion

Compile a structured record of the client.

Recognise acute life-threatening emergencies and initiate appropriate management

Family planning and Sexually Transmitted Infections (STI's)

UNDER SUPERVISION, the student should be able to:

Give the client appropriate health education about her method of choice (including side-effects, when to return, what to do if she forgets her pill etc.)

Know the policy and indications for pap smears.

Observe and assist with pap smears.

Recognise the signs and symptoms of an STI

Have a basic understanding of STI management

Give health education on the prevention of STIs

Tuberculosis (TB)

UNDER SUPERVISION, the student should be able to:

Recognise the signs and symptoms of TB

Conduct the screening tests for TB including sputum collection and Tine tests

Understand the management of TB in the community setting

Understand and participate in the DOTS programme

Give health education to the client regarding prevention and management of TB

Know the medications used in the treatment of TB including actions, indications, contra-indications, interactions with other drugs and side-effects

Understand the notification system and record-keeping for TB patients

HIV/AIDS

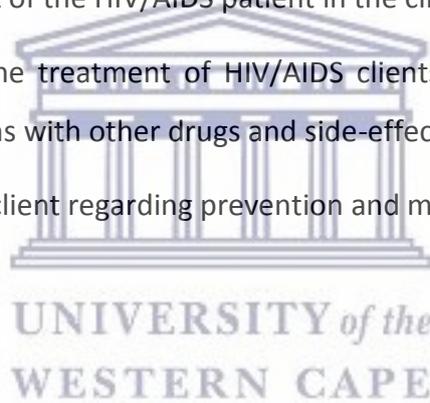
UNDER SUPERVISION, the student should be able to:

Recognise the signs and symptoms related to the clinical staging of the HIV/AIDS patient

Understand the management of the HIV/AIDS patient in the clinic

Know the ART regimen in the treatment of HIV/AIDS clients, including actions, indications, contra-indications, interactions with other drugs and side-effects

Give health education to the client regarding prevention and management of HIV/AIDS



UNIVERSITY ...

SCHOOL OF NURSING

**Assessment tool: History taking and observations of a patient with a head and neck
complaint**

Student name:

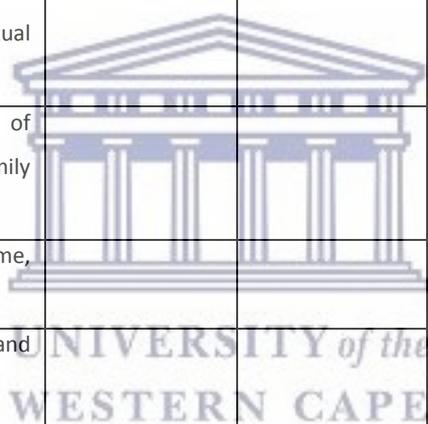
Student Number:Facility:

.....

ASSESSMENT SCALE					
Omit criteria	No marks allocated (write the number allocated in the box provided)				
Required guidance	1 mark				
Met criteria	2 marks				
Not applicable	NA (deduct mark from the total mark allocated)				
Comments	Provide comments to clarify your mark allocation				
* Critical point	Deduct 50% if not competent.				
Final score	Competent = 50% and above Not yet competent = 0 - 49%				
SCALE	Met criteria 2 marks	Required guidance 1 mark	Omit criteria	NA	COMMENTS
INTERVENTION:					
Assessment and planning					
Preparation for history taking and vital signs					
1	Student nurse: Professionally dressed according to policy with identification tag				
2	Hands washed & nails short.				
3	Patient: Identification to prevent medico – legal hazards				
4	Introduction of nurse and examiner				
5	Confirm language preference				
6	Explain procedure and confirm consent to continue				
7	Ensure comfort e.g. position, empty bladder				
8	Environment: ensure privacy and hygiene practices				

9	Adequate lighting for inspection of systems					
10	Equipment: collect and prepare all the necessary equipment					
11	Ensure hygiene practices are adhered to					
12	Documentation e.g. folder					
Implementation						
13	Observe physical and emotional appearance: Physical: height & weight					
14	Posture that may reflect mood or the presence of a physical problem for e.g. pain, gait/ abnormal body movements,					
15	Hygiene, grooming, body & breathe odour.					
16	Emotional: signs of distress or discomfort					
17	Cooperative attitude and behaviour					
18	Vital signs: Measure & interpret temperature reading					
19	Measure & interpret pulse rate					
20	Measure & interpret respiration rate					
21	Measure & interpret blood pressure					
22	Measure & interpret urinalysis					
23	Measure & interpret height BMI					
24	History taking: Complete biographical data Present illness (record in patient's own words)					
25	If pain is a problem, ask pain questions: Site					
26	Duration of the pain					
27	Character of the pain					
28	Intensity of the pain					
29	Periodicity of the pain					
30	Radiation of the pain					
31	Aggravating and relieving factors					
32	*Allergies: for medication					

33	Allergies: for food, animals and environmental factors					
34	Past illness: Include immunizations for e.g. measles, mumps. Also diagnostic tests, injuries and accidents.					
35	Medication use: reason for taking and duration					
36	Prescribed medication					
37	Over the counter and herbal medication					
38	Family history: children and relatives, identify genetic, familial and infection related diseases.					
39	Nutritional history: dietary intake, appetite and weight loss					
40	Sexual and reproductive history: use of contraceptives, condoms, sexual practices, partners, HIV test					
41	Social history: smoking, alcohol, use of drugs, exercise /activity level and family relationships /married etc.					
42	Occupational history: source of income, unemployment, grant					
43	Demonstrate examination and interpretation of 'JACCOLD' Jaundice					
44	Oedema					
45	Anaemia					
46	Clubbing					
47	Dehydration					
48	Cyanosis					
49	Demonstrate examination of the lymphadenopathy of the head and neck: Occipital lymph node					
50	Pre and post orricular lymph node					
51	Tonsillar lymph node					
52	Submandibular lymph node					
53	Sub mental lymph node					
54	Superficial cervical lymph node					



55	Deep cervical lymph node					
56	Posterior cervical lymph node					
57	Supraclavicular lymph node					
Evaluation						
58	Nursing diagnosis based on history taking, vital signs, JACCOLD and appearance of the patient					
59	Sound communication skills					
60	Patient safety maintained					
Total = / 120						
Percentage = %						

Feedback to student regarding performance:

COMPETENT = 50% and above

NOT YET COMPETENT = 0-49%

SIGNATURE OF EVALUATOR: DATE.....

SIGNATURE OF STUDENT: DATE.....

UNIVERSITY *of the*
WESTERN CAPE

HISTORY TAKING AND HEALTH PROMOTION WORKSHEET

Student name: Student number:
Facility: Date:

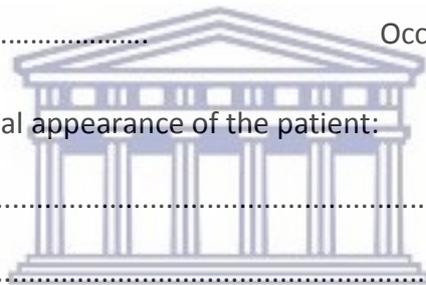
HISTORY OF PATIENT

Biographical data:

Name: Folder no:
Address: Marital status:
Age: Religion:
Gender: Occupation:

Observe physical and emotional appearance of the patient:

.....
.....
.....
.....
.....



UNIVERSITY *of the*
WESTERN CAPE

Measure vital observations:

.....
.....
.....

Description of present complaint/s

.....
.....
.....

Pain questions, if patient identify pain in the complaint:

.....
.....

Allergies:

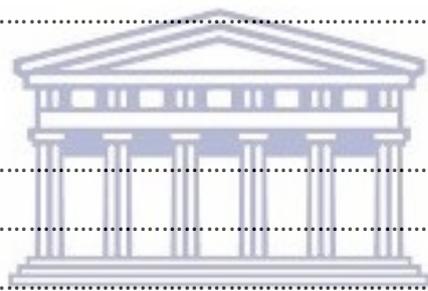
.....
.....

Past illness:

.....
.....
.....
.....

Medication use:

.....
.....
.....



UNIVERSITY *of the*
WESTERN CAPE

Family history:

.....
.....
.....

Nutritional History / health promotion:

.....
.....

Sexual and reproductive history /health promotion:

.....
.....
.....

Social History/ health promotion:

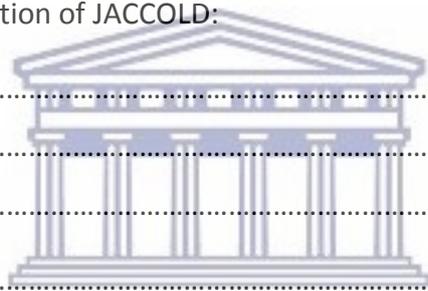
.....
.....
.....
.....
.....

Occupational health status:

.....
.....
.....

Demonstration and interpretation of JACCOLD:

.....
.....
.....
.....



UNIVERSITY *of the*
WESTERN CAPE

Nursing diagnosis:

.....
.....

Signature of evaluator: Date.....

Signature of student: Date.....

EVIDENCE OF PRACTICES IN THE CLINIC

Submit 5 cases: (HIV/AIDS, TB, STI's, Family Planning and Head & neck complaint) as evidence in your portfolio by completing the history taking and health promotion worksheet

Date	Activities practised by student: include health promotion opportunities	Signature of Registered Nurse
HIV/AIDS practices		
	History taking of a HIV/AIDS patient	
	Clinical staging of a patient	
	Implementing the ACTS model	
	Review of a client's ART Regimen	
TB practices		
	History taking of a new/follow up TB case	
	TB workup: sputum collection	
	Initiating TB treatment under supervision	
	DOTS treatment in the clinic	
STI practices		
	History taking of genital symptoms	
	Examination of genital symptoms	
	Initiate Syndromic treatment	
	Management of a partner with an STI	
Family planning practices		
	Injectable contraceptives	
	oral contraceptives	
	IUD contraceptives	
	Implanon contraceptive method	
Date	Activities practised by student	Signature of supervisor
Skills laboratory: evidence of practice of the physical examination skills		
	Examination of the skin, nails & hair	

	Examination of the eyes, test pupils and muscle function of eyes	
	Examination of the pinna, ear canal and tympanic membrane	
	Examination of the nose and sinuses	
	Examination of the mouth and throat	
	Examination of the lymph nodes	
	Examination of the chest and listen to lung sounds.	
Health facility/Clinic: evidence of practice of the physical examination skills		
	Examination of the skin, nails & hair	
	Examination of the eyes, test pupils and muscle function of eyes	
	Examination of the pinna, ear canal and tympanic membrane	
	Examination of the nose and sinuses	
	Examination of the mouth and throat	
	Examination of the lymph nodes of head & neck	
	Examination of the chest and listen to lung sounds.	

PORTFOLIO OF EVIDENCE: ASSESSMENT TOOL FOR EXAMINERS

Student name: **Number:** **Facility:**

Portfolio marked by: **Date:**

ASPECT		MARK
Tutorial = 15%		
Clinical procedure: History taking & physical examination = 35%		
Evidence of Clinical Practices = 50%		
Evidence of HIV/AIDS practices in the health facility = 5%		
1	History taking of a HIV/AIDS patient	
2	Clinical staging of a patient	
3	Implementing the ACTS model	
4	Review of a client's ART Regimen	
5	Health promotion activities	
Evidence of TB practices in the health facility = 5%		
6	History taking of a new TB client	
7	TB workup: sputum collection (GeneXpert test)	
8	Initiating TB medication/treatment under supervision	
9	DOTS treatment in the clinic	
10	Health promotion activities	
Evidence of STI practices in the health facility = 5%		
11	History taking of genital symptoms	
12	Examination of genital symptoms	
13	Initiate Syndromic treatment under supervision	
14	Management of a partner with an STI	
15	Perform a Cervical screening/ Pap smear	

Evidence of contraceptive practices in the health facility = 5%		
16	History taking of a patient for contraception	
17	Injectable contraceptives	
18	Implanon witness	
19	Oral contraceptives	
20	IUD contraceptives	
EVIDENCE OF PHYSICAL EXAMINATION SKILLS PRACTISED IN THE SKILLS LAB = 20%		MARK
21	History taking of a patient with a head and neck complaint	
22	Inspection and palpation of the skin	
23	Examination of the hair & nails	
24	Inspection of the external structures of the eyes	
25	Test the pupils	
26	Examination of the muscle function of the eyes	
27	Inspection of the pinna	
29	Palpation of the pinna	
30	Inspection of the ear canal with autoscope	
31	Inspection, palpation and percussion of the frontal sinuses	
32	Inspection, palpation and percussion of the maxillary sinuses	
33	Inspection of the mouth	
34	Examination of the back of throat (pharynx)	
35	Inspection of the lymph nodes of the head	
36	Inspection of the lymph nodes of the neck	
37	Palpation of the lymph nodes of the head	
38	Palpation of the lymph nodes of the neck	
39	Examination of the chest	
40	Listen to lung and cardiac sounds	
EVIDENCE OF PHYSICAL EXAMINATION SKILLS PRACTISED IN THE CLINIC = 10%		

41	Examination of the skin, nails and hair	
42	Examination of the external eyes and testing the pupils	
43	Examination of the muscle function of the eyes	
44	Examination of the pinna and ear canal	
45	Examination of the external nose and nasal cavities	
46	Examination of the frontal and maxillary sinuses	
47	Examination of the of mouth and back of throat	
48	Examination of the lymph nodes of the head	
49	Examination of the lymph nodes of the neck	
50	Examination of the chest	
TOTAL		



UNIVERSITY *of the*
WESTERN CAPE

PART C. GENERAL INFORMATION

POLICY GUIDELINE FOR SHARP OBJECT INJURIES OR EXPOSURE TO BLOOD AND BODY FLUIDS

Introduction

This policy should be read in conjunction with the HIV and AIDS Policy of the University ...

Students allocated to the clinical areas face risks of accidents that may result in infections such as Hepatitis B and HIV. All employees and students have to implement standard precautions to effectively eliminate the risk of infection and transmission of blood-borne pathogens.

What to do in cases of an injury -PAWC and Community Health Services:

Immediately after the injury, flush the area under running water and wash with soap and water.

Report to the team leader on duty (Professional Nurse in-charge), who will assess the incident. If the UWC Clinical Supervisor is on site, he/she has to be contacted as well.

You will be referred to the Trauma / Casualty Unit for counselling (student & patient, where applicable).

A blood sample from the source (5ml clotted blood in adults & 0,5ml from neonates) will be drawn for baseline data after informed consent had been obtained.

A blood sample should be drawn from the student/employee after appropriate counselling at the Emergency Unit/Student Health Centre.

An incident report (injury-on-duty form) has to be compiled and submitted to the relevant persons (*responsible lecturer / supervisor / clinical co-ordinator at ...*) within 24 hours after the incident has occurred.

Post-exposure prophylaxis (PEP) should preferably be commenced within 24 hours to reduce the transmission of HIV (N.B: the earlier this is done, the better, preferably within the first 4 hours after injury).

After the results of both the student and the source are known, a final decision whether to continue with PEP will be taken by the doctor in charge of treating the student.

All forms are to be completed in accordance with the requirements of the Compensation for Occupational Injuries and Diseases Act (COIDA). To be considered for compensation, the health care worker must prove that an occupational injury had occurred; hence a register has to be kept as well as baseline and follow-up bloods to be taken.

One of the following persons at ... Campus to be contacted after the initial first aid measures have been instituted at the Emergency Unit where the injury occurred.

No.	AREA / PERSON TO CONTACT	TEL NUMBERS
1.	Student Health Clinic	021 (Office Hours)
2.	Student Counselling	021 (Office Hours)
3.	Health and Safety Officer	021 (Office Hours)
4.	School of Nursing:	021 (Office Hours) (After Hours)

UNIVERSITY *of the*
WESTERN CAPE

UNIVERSITY ...**FACULTY OF COMMUNITY & HEALTH SCIENCES***Reporting an incident*

Please report any incident* that occurs in which you feel unsafe within the community during your training. Complete the form below within 24 hours and hand in to the relevant supervisor/lecturer from your department. If a criminal offence has occurred, immediately report to the local police station.

REPORT – a separate form to be filled in by each student involved

Name: _____ Date of incident: _____

Student number: _____ Department: _____

Name of CBO / placement: _____

Place of incident: _____ Time of incident: _____

(Full street address) _____

SHORT DESCRIPTION OF INCIDENT – including damage/loss:

Action taken/ safety guidelines followed

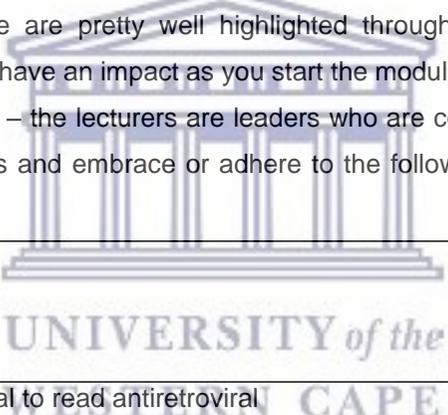
Signature: _____

Reported to local police YES: NO If available, case number: _____

Official use only: Received by _____ Date: _____

Action taken: _____

ANNEXURE 24: REVIEW OF THE PRIMARY CARE AND CLINICAL SKILLS MODULE BY A SPECIALIST IN THE FIELD OF PHC

POSITIVES	POSSIBLE ADDITIONS	COMMENTS
	<p>add values to the module guide, in the form of that which you embrace as a department. For instance, your core values examples would be compassionate, patient centered care; commitment to professionalism and integrity, lifelong learning, problem solving skills, teamwork and collaboration, respect for diversity and accountability. These are pretty well highlighted throughout your document but would have an impact as you start the module guide. A statement such as – the lecturers are leaders who are committed to exceptional results and embrace or adhere to the following core values</p>	<p>Perhaps add in what they already know about the subject?</p>
<p>You have included all the names of lecturers involved and contact details which is good.</p>		
	<p>Adjust Anti-Retro Viral to read antiretroviral</p>	
	<p>I do not have a previous document to compare with but bear in mind that you need to answer the questions related to strengths, weaknesses, constraints and opportunities regarding your module/curriculum document</p>	<p>Why did you review the programme? Are you achieving the goals and what are these goals linked to the previous document? What can you do better?</p>
<p>The module overview is clear and</p>		<p>I would add life-long learning is required and that</p>

<p>assists students to visualize the way forward regarding their personal, professional and academic development</p>		<p>this starts now at student level</p>
<p>Module descriptor is clear</p>		
<p>Teaching and learning section is clear and adequately introduces cased based learning for the student</p>		
<p>Clinical skills development section: Explains to the student what they are intended to learn, and the students are encouraged to take responsibility for their own learning which is positive.</p>	 <p>UNIVERSITY <i>of the</i> WESTERN CAPE</p>	
<p>Module schedule is well explained in table form which clarifies clearly the hours/activities/venues/and due dates, this is clear and well presented, including materials to be used and evaluation schedule</p>		
	<p>Pg 16 overarching skills and attributes: does this pertain to the students? Be a little clearer here perhaps? This does follow on from</p>	

	<p>graduate attributes, learning outcomes and assessment: but it is not entirely clear where this aspect fits in and why you need it here, please add that this is related to the students and why they need these attributes and skills? For instance:</p> <p>skilled communicators – in the inter-professional team? With patients? Regarding referrals? All of these?</p> <p>Interpersonal flexibility & confidence to engage across difference – and then the sentence ends, please complete the sentence to clarify what you expect from the students</p>	
	<p>Pg 21: assessment tool:</p> <p>#17: describe the drug treatment/management</p> <p>I would divide these to give a mark for drug treatment and the next line for management since they both have significant information</p> <p>#19: sub divide referencing included and then in the next line accurate, the accurate referencing should be awarded a mark. As it stands the person who referenced accurately gets the same mark as the one who was accurate</p>	
CLINICAL SKILLS GUIDE 2016: HISTORY TAKING AND OBSERVATION OF A PATIENT WITH A HEAD AND NECK COMPLAINT		
		<p>Preparation for procedure:</p> <p>Add in:</p> <p>Use patients preferred name/mode of address</p> <p>Ensured patient readiness, comfort and privacy</p>

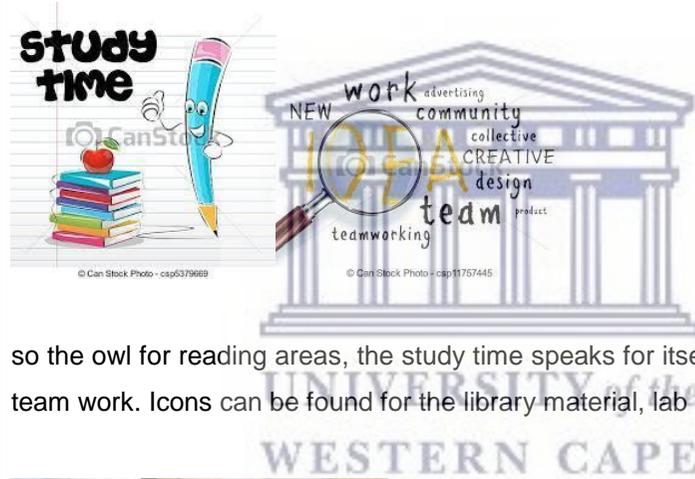
		and remove any barriers to communication
		<p>Family history: summary of ages of immediate family members (including whether parents and siblings are alive and causes of death)</p> <p>Any family members with similar signs and symptoms</p> <p>Family relationships: interaction patterns: happy? Distant/dysfunctional</p>
		<p>Social history: add in:</p> <p>sources of social support ie friends, community, spiritual beliefs etc</p>
	<p>The assessment tool for History taking and observations of a patient with head and neck complaint contains the history taking, JACCOLD and lymph node check but not an examination of the head ie eyes, ears, mouth and nose – therefore I do not think that this marking instrument will fully suffice to determine what the actual complaint of the patient is.</p> <p>Perhaps change the name of the assessment tool to history taking and observations of a patient using JACCOLD and examination of lymphadenopathy of the head and neck.</p> <p>This will cover what the instrument covers, because there is no examination of the eye/ear/mouth/nose which will provide the</p>	

	<p>diagnosis of a head and neck complaint.</p> <p>The JACCOLD exam covers extremities as well as head and neck so is not specific to head and neck.</p> <p>This is of course simply a suggestion. See more after the table</p>	
	<p>Pupil response on pg 39 – lights need to be off to check the pupils reaction to light –</p> <p>For eye examination perhaps consider adding in which cranial nerves are tested when checking for cardinal movements/extra ocular movement</p>	
<p>The assessment tool pg 30-32 is well presented but I am not sure how you will get to a nursing diagnosis based only on the history/appearance/and JACCOLD –and an examination of the lymph nodes - Please see comments below the table</p>	 <p>The logo of the University of the Western Cape, featuring a classical building with columns and the text 'UNIVERSITY of the WESTERN CAPE' below it.</p>	<p>On page 31 & 32 add in the marking scale at the top of each page so that the examiner does not have to page back to remind themselves of the criteria while busy with evaluation</p>
		<p>The skills lab sessions documents pages 36-42, any reason why these are not in table/instrument/tool form?</p>
Overall module guide:		
	<p>I would add in some icons at each section to ensure that each new section is clearly highlighted, due to the amount of data you are</p>	

giving the students, and itemize what areas are reading/which are



for study/which are for group work and so on



so the owl for reading areas, the study time speaks for itself and the team work. Icons can be found for the library material, lab work



might break the amount of typed pages and keep the students interested, but really just a thought (and what I do).

ANNEXURE 25: EXAMPLE OF THE NOTIFICATION OF COMPLETION OF TRAINING (R425, 1985, AS AMMENDED)



SOUTH AFRICAN NURSING COUNCIL
NOTIFICATION OF COMPLETION OF TRAINING
**EDUCATION AND TRAINING OF A NURSE (GENERAL,
 PSYCHIATRIC AND COMMUNITY) AND MIDWIFE LEADING
 TO REGISTRATION**

Government Notice No. R425 of 19 February 1985 (as amended)

<ul style="list-style-type: none"> • This information must be provided by the Person in charge of the Nursing Education Institution • Incomplete and incorrect forms will not be processed
--

1. DETAILS OF THE NURSING EDUCATION INSTITUTION	
Name (as approved by Council)	
Correspondence Number (S- File No.)	
Accreditation certificate number	
Physical address	Postal address
Postcode	Postcode
Telephone Number(s)	
Fax Number	
E-mail Address	
2. DETAILS OF PERSON IN CHARGE OF NURSING EDUCATION INSTITUTION	
Name of Person In Charge of the Nursing Education	
SANC Reference Number	
Professional Qualifications (not academic qualifications)	
3. NAME OF UNIVERSITY OF AFFILIATION / ASSOCIATION (IN CASE OF COLLEGE OR NURSING SCHOOL)	

4. LEARNER DETAILS				FOR OFFICE USE	
Surname					
Given Names in full (according to ID/Passport)					
SANC Reference Number					
SA Identity Document Number					
OR (if foreign)	Passport Number				
	Country of issue				
Date of Commencement		(Year)	(Month)	(Day)	
Date of Resumption (if applicable)		(Year)	(Month)	(Day)	
Date of Completion		(Year)	(Month)	(Day)	
5. RECORD OF EDUCATION AND TRAINING (N.B. TRANSLATE COUNCIL PERIOD TO HOURS)					
5.1 Total Theory		Prescribed Periods & Hours		Achieved Hours	For office use
		By SANC	NEI		
- Biological and Natural Sciences					
- Social Sciences					
- Fundamental Nursing Science					
- Ethos and Professional Practice					
- General Nursing Science					
- Psychiatric Nursing Science					
- Community Nursing Science					
- Midwifery					
- Pharmacology					
- Other (specify)					
Total					
5.2 PRACTICA					
5.2.1 GENERAL NURSING SCIENCE (INCLUDING ACUTE, CHRONIC & LONG TERM, IN/OUT OF HOSPITAL)					
Practice area	Approved	Achieved Hours		Total	For office use
		Day	Night		
<i>Minimum total = 4000 hours for all the disciplines</i>					
General Nursing Science					
Medical Wards					
Surgical Wards					
Paediatric Wards					
Casualty & Out Patient Department					
Operating Theatre					
Other (specify)					
Total					

5.2.2 PSYCHIATRIC NURSING SCIENCE					
Therapy for the Mentally Retarded					
Admission (Acute Care)					
Long-term and Security Units					
Children and Adolescents					
Geriatric Nursing					
Community & Rehabilitation					
Occupational & Recreational Services					
Other (specify)					
5.2.3 MIDWIFERY NURSING SCIENCE					
<i>Minimum total hours 1000</i>					
Ante-natal Services					
Labour ward/delivery room					
Neonatal Care					
Post-natal care services					
Other (specify)					
Requirement specification: These include but are not limited to examples set out below:					
Midwifery skills	Prescribed	Achieved	For office use		
Supervision of Pregnant women (in numbers)					
Ante-natal patients with abnormal conditions					
Internal examinations					
Normal deliveries observed					
Women progressed during the 1 st stage of labour					
Deliveries by a learner					
Conducting third and fourth stages of labour					
Performance of episiotomies					
Suturing of episiotomies and 1 st and 2 nd degree tears.					
Complicated deliveries					
Post-partum care of mother and baby (including examinations)					
Breathing and relaxation technique					
Ante-natal and post-natal exercises					
Administration of local anaesthesia excluding pudendal block					
Other (specify)					

5.2.4 COMMUNITY NURSING SCIENCE			
Health Education			
Environmental Control			
Mother & Child Services including preschool child			
School Health Services			
Occupational Health Services			
Geriatric Health Services			
Psychiatric Health Services			
Neonatal Care Services			
Prevention and control of communicable diseases			
Health Assessment Treatment and Care			
Rehabilitation			
Community Resource			
Other e.g. IMCI, PCTMT (specify)			
5.3 SUMMATIVE ASSESSMENT OUTCOMES/YEAR MARK			
Theory	Practical	For office use	
First year			
Second year			
Third year			
Fourth year			
Other (specify)			

Declaration that a learner has met the educational requirements to be registered as a Nurse and Midwife			
Learner details			
Surname	_____		
Given names in full	_____		
SANC reference number	_____		
South African identity document number	_____		
OR Passport number	_____		
Country of issue	_____		
Training details(*)			
Name of Institution: _____			
Date of commencement	Year:	Month:	Day:
Date of completion	Year:	Month:	Day:
Declaration by Person in charge of nursing education programme			
I hereby declare that the aforementioned learner:			
<ul style="list-style-type: none"> Has complied with all the prescribed minimum education and training programme requirements for registration as a Nurse and Midwife in terms of Government Notice No. R.425 of 19 February 1985; and Has been assessed and found to have the required competencies as per the prescribed teaching guide to practice in accordance with the prescribed scope of practice of a Nurse and Midwife. 			
I further declare that:			
<ul style="list-style-type: none"> The information provided is accurate and based on the authentic education and training records of the said learner; All the education and training of the learner were accurately recorded for the duration of the programme; The nursing education institution has in its possession all the original education and training records, including but not limited to assessment and clinical records; There is no evidence that such training records were tampered with or are in any way fraudulent; and In the event that any tampering of the record or fraudulent records are detected after this declaration is made, I undertake to immediately notify the Council thereof in writing. 			
I fully understand the meaning and implications of this declaration(**)			
Full names (Print)	_____		
Designation	_____		
SANC reference number	_____		
Signature	_____		
Date	_____		
Declaration by Person in charge of nursing education institution			
I declare that the information provided is accurate and based on the authentic education and training records of the said learner.			
I fully understand the meaning and implications of this declaration(**)			
Full names (Print)	_____	Affix Stamp of the Nursing Education Institution here	
Designation	_____		
SANC reference number	_____		
Signature	_____		
Date	_____		
(*) Any entry into the register made in error or through misrepresentation will be deleted/removed from the register.			
(**) Any person that makes a false declaration or misrepresents the facts or information given in this declaration may be charged with an offence in terms of sections 46 and 54 of the Nursing Act, 2005 (Act No. 33 of 2005).			