

**MOBILE DEVICES: TAXATION STUDENTS' PERCEPTION AND  
ACCEPTANCE OF ENGAGING WITH A MOBILE LEARNING  
ENVIRONMENT**

by

Juanita Dos Santos  
(Student Number: 26056284)

Submitted in partial fulfilment of the requirements for the degree  
MAGISTER COMMERCII (Taxation)

in the

FACULTY OF ECONOMIC AND MANAGEMENT SCIENCES

at the

UNIVERSITY OF PRETORIA

Study leader:  
Mrs SJ Pienaar

Date of submission:  
2014-01-20

## ACKNOWLEDGEMENT

The following people contributed to the success of this study and I am deeply indebted to them for their support and on-going encouragement:

- My heavenly Father, without whom this dissertation would never have been completed. Thank you for all the wisdom and strength You provided me during this journey.
- My husband, best friend and love of my life, HP Venter. Thank you for believing in me and walking this road with me. I love you truly.
- My sister, Soné, for your on-going assistance throughout this process. I truly appreciate all your guidance and encouraging words of wisdom. Love you, sis.
- My parents, Henrique and Hannie Dos Santos, whom have given me the chance to follow my dream. Thank you for all your support and love. I love you dearly.
- My family-in-law, for all your kindness and love.
- All my friends.
- My study leader, Saré, for her friendship, assistance and guidance throughout this study.
- My colleagues, for allowing me to complete this study.
- The students who participated and contributed to this study.

## ABSTRACT

# MOBILE DEVICES: TAXATION STUDENTS' PERCEPTION AND ACCEPTANCE OF ENGAGING WITH A MOBILE LEARNING ENVIRONMENT

by

Juanita Dos Santos

STUDY LEADER: MRS SJ PIENAAR

DEPARTMENT: TAXATION

DEGREE: MAGISTER COMMERCII (TAXATION)

Universities should strive to educate students by applying new learning environments where students are given the opportunity to explore the world of education by the use of mobile devices. These technologies and mobile devices are already second nature to them and applying these devices in a learning environment will improve the students' learning experience. It is sensible to make use of these new technologies to get students attention, since students will find learning interesting and more enjoyable.

Students' attitude towards a mobile learning environment and learning with mobile devices has already received much attention in existing literature. This study aimed to determine whether South African, University students will welcome the use of mobile devices during their studies, especially in the field of Taxation. The study also focussed on students' attitudes towards using e-books instead of the hardcopy textbooks during their studies and during open-book assessments.

This longitudinal study made use of two questionnaires to obtain the feedback on students' perception on what they believe mobile learning to be, their acceptance and willingness to engage with a mobile learning environment and to determine whether their attitudes towards mobile learning have change over two academic years.

Furthermore, statistical analysis of the data was done to determine whether a significant difference exists between the responses between male and female students. The results

indicated that more males are interested in using mobile technologies for educational purposes, however, it is not significant.

It was concluded that students, when given the opportunity, are interested to engage with a mobile learning environment. It was lastly concluded that no significant change in acceptance and willingness of engaging with a mobile learning environment exists over two academic years.

Keywords:

*Mobile learning environment*

*Mobile devices*

*E-books*

*Acceptance*

*Willingness*

*Engage*

*Commerce students*

## **OPSOMMING**

# **MOBIELE TOESTELLE: BELASTING STUDENTE SE SIENING EN AANVAARDING OM IN 'N MOBIELE LEEROMGEWING DEEL TE NEEM**

deur

Juanita Dos Santos

STUDIELEIER: MRS SJPIENAAR  
DEPARTEMENT: BELASTING  
GRAAD: MAGISTER COMMERCII (BELASTING)

Universiteite moet daarna streef om studente te onderrig met behulp van nuwe leeromgewings, waar studente die geleentheid gegun word om die wêreld van die onderwys te verken deur die gebruik van mobiele toestelle. Hierdie tegnologie en mobiele toestelle is reeds tweede natuur vir hulle en die toepassing van hierdie toestelle in 'n leeromgewing sal die studente se leerervaring verbeter. Dit is sinvol om van hierdie nuwe tegnologie gebruik te maak om studente se aandag te kry, aangesien studente leer interessant en meer prettig sal vind.

Studente se houding teenoor 'n mobiele leeromgewing en leer met mobiele toestelle het reeds baie aandag in bestaande literatuur ontvang. Hierdie studie se mikpunt was om te bepaal of Suid-Afrikaanse, Universiteitstudente die gebruik van mobiele toestelle sal verwelkom tydens hul studies, veral in die gebied van Belasting. Die studie het ook gefokus op studente se houding teenoor die gebruik van e-boeke in plaas van gedrukte boeke tydens hul studies en tydens oop-boek assesserings.

Hierdie longitudinale studie het gebruik gemaak van twee vraelyste om die terugvoer te bekom oor studente se persepsie van wat hulle glo mobiele leer is, hulle aanvaarding en bereidwilligheid om deel te neem in 'n mobiele leeromgewing en om te bepaal of hul houding teenoor 'n mobiele leeromgewing verandering het oor twee akademiese jare.

Verder, is statistiese ontleding van die data gedoen om te bepaal of 'n beduidende verskil tussen die terugvoer van manlike studente en vroulike studente bestaan. Die resultate dui daarop dat meer mans belangstel in die gebruik van mobiele tegnologie vir opvoedkundige doeleindes maar dit is nie beduidend nie.

Die studie het tot die gevolgtrekking gekom dat studente, wanneer toegelaat, belangstel om deel te neem in 'n mobiele leeromgewing. Laastens het die studie tot die gevolgtrekking gekom dat daar geen beduidende verandering bestaan met betrekking tot die aanvaarding en bereidwilligheid van studente om deel te neem in 'n mobiele leeromgewing oor twee akademiese jare nie.

Sleutelwoorde:

*Mobiele leeromgewing*

*Mobiele toestelle*

*E-boeke*

*Aanvaarding*

*Bereidwilligheid*

*Deel te neem*

*Studente in handelsvakke*

## TABLE OF CONTENTS

ACKNOWLEDGEMENT .....	II
ABSTRACT.....	III
OPSOMMING .....	V
ABBREVIATIONS.....	VIII
CHAPTER 1 INTRODUCTION .....	1
1.1 BACKGROUND.....	1
1.2 RATIONALE FOR THE STUDY .....	3
1.3 PURPOSE STATEMENT .....	3
1.4 RESEARCH OBJECTIVES .....	4
1.5 HYPOTHESES.....	4
1.6 REPLICATION OF PREVIOUS STUDIES.....	4
1.7 IMPORTANCE AND BENEFITS OF THE CURRENT STUDY.....	7
1.7.1 Educational benefits.....	7
1.7.2 Environmental benefits.....	10
1.8 DELIMITATIONS AND ASSUMPTIONS .....	10
1.8.1 Delimitations.....	10
1.8.2 Assumptions.....	11
1.9 DEFINITION OF KEY TERMS.....	12
1.10 SUMMARY .....	13
CHAPTER 2 LITERATURE REVIEW .....	14
2.1 INTRODUCTION.....	14
2.2 OVERVIEW OF MOBILE LEARNING .....	14
2.2.1 Mobile learning defined .....	15
2.2.2 Opportunities afforded by mobile learning.....	16
2.2.3 Challenges associated with mobile learning.....	18

2.3	SUCCESSFUL IMPLEMENTATION OF MOBILE LEARNING .....	19
2.4	STUDENTS' WILLINGNESS TO ENGAGE WITH A MOBILE LEARNING ENVIRONMENT .....	20
2.4.1	General acceptance towards mobile learning.....	20
2.4.2	Acceptance towards open-book assessments .....	22
2.4.3	Acceptance towards e-books .....	23
2.5	MOBILE SUPPORT OFFERED BY THE UNIVERSITY OF PRETORIA .....	24
2.6	CONCLUSION.....	25
CHAPTER 3 RESEARCH DESIGN AND METHODOLOGY .....		26
3.1	INTRODUCTION .....	26
3.2	DESCRIPTION OF OVERALL RESEARCH DESIGN .....	27
3.3	METHODOLOGY AND SAMPLING .....	28
3.3.1	Target population, context of study and units of analysis .....	28
3.3.2	Sampling methods and sample size .....	29
3.4	DATA COLLECTION .....	31
3.4.1	Survey method .....	31
3.4.2	Questionnaire design .....	32
3.4.3	Pre-testing.....	42
3.4.4	Errors in data collection.....	42
3.5	DATA ANALYSIS .....	44
3.6	ASSESSING AND DEMONSTRATING THE QUALITY AND RIGOUR OF THE PROPOSED RESEARCH DESIGN.....	48
3.7	RESEARCH ETHICS .....	49
3.7.1	Ethical clearance from the Department of Taxation's Research Ethics Committee .....	49
3.7.2	Privacy and anonymity of participants involved .....	50
3.7.3	Informed consent and voluntary participation .....	50
3.7.4	Confidentiality of data obtained from the participants.....	51
3.8	CONCLUSION.....	51



CHAPTER 4 ANALYSIS OF DATA.....	52
4.1    INTRODUCTION .....	52
4.2    DEMOGRAPHIC PROFILE OF RESPONDENT GROUP .....	53
4.3    FINDINGS FROM THE FIRST QUESTIONNAIRE (QUESTIONNAIRE (i)).....	55
4.3.1    Students' views on what they believe mobile learning to be.....	56
4.3.2    Mobile electronic devices students own and use.....	59
4.3.3    Third-year Taxation students who are already using a mobile electronic device for educational purposes.....	60
4.3.4    Third-year students' acceptance towards and willingness to engage with a mobile learning environment.....	62
4.3.5    Summary .....	67
4.4    FINDINGS OF THE FOLLOW-UP QUESTIONNAIRE (QUESTIONNAIRE (ii)) .....	68
4.4.1    Fourth-year Taxation students who use a mobile electronic device for educational purposes .....	68
4.4.2    The possible change in acceptance towards and willingness to engage with a mobile learning environment.....	70
4.4.3    Summary .....	79
4.5    CONCLUSION.....	80
CHAPTER 5 CONCLUSION.....	82
5.1    INTRODUCTION .....	82
5.2    METHODOLOGY .....	83
5.3    SUMMARY OF FINDINGS .....	84
5.4    HYPOTHESES.....	86
5.5    CONTRIBUTION OF THIS STUDY.....	87
5.6    SUGGESTIONS FOR FUTURE RESEARCH .....	88
5.7    FINAL CONCLUSION .....	89
LIST OF REFERENCES.....	90

## APPENDICES

APPENDIX A: Data collection instrument - Questionnaire (i) and consent form... 98

APPENDIX B: Data collection instrument - Questionnaire (ii) and consent form 104

## LIST OF FIGURES

Figure 1: Percentage of third-year Taxation students using mobile electronic devices for educational purposes.....	61
Figure 2: How do third-year students apply their mobile device during their Taxation lectures? .....	62
Figure 3: Percentage of the fourth-year Taxation students using mobile electronic devices for educational purposes.....	69
Figure 4: Taxation 700/760 male students' interest in engaging with a mobile learning environment compared to their response in 2012 .....	71
Figure 5: Taxation 700/760 female students' interest in engaging with a mobile learning environment compared to their response in 2012 .....	72
Figure 6: Taxation 700/760 male students' interest in purchasing the textbooks in electronic format versus hardcopy, compared to their response in 2012 .....	74
Figure 7: Taxation 700/760 female students' interest in purchasing the textbooks in electronic format versus hardcopy, compared to their response in 2012 .....	74
Figure 8: Taxation 700/760 male students' interest in using the textbooks in electronic format or hardcopy in open-book assessments, compared to their response in 2012.....	76
Figure 9: Taxation 700/760 female students' interest in using the textbooks in electronic format or hardcopy in open-book assessments, compared to their response in 2012.....	76
Figure 10: Taxation 700/760 male students' views on whether the University should consider building the cost of an Apple iPad into the tuition fees, compared to their responses in 2012.....	78
Figure 11: Taxation 700/760 female students' views on whether the University should consider building the cost of an Apple iPad into the tuition fees, compared to their responses in 2012.....	78

## LIST OF TABLES

Table 1: Abbreviations used in this document .....	viii
Table 2: Comparison between this study and Croop’s (2008) study .....	5
Table 3: Definitions of key terms used in this study .....	12
Table 4: Design of Questionnaire (i) – Section B .....	35
Table 5: Demographic profile of respondents: Gender and language .....	53
Table 6: Demographic profile of respondents: Language and race .....	54
Table 7: Demographic profile of respondents: How students’ studies are financed .....	54
Table 8: Students’ view on what they believe mobile learning to be .....	57
Table 9: Correlation between male and female students regarding what they believe mobile learning to be .....	58
Table 10: Mobile electronic devices students own and use .....	59
Table 11: Correlation between third-year male and female students who use their mobile device for educational purposes .....	61
Table 12: Students’ interest in carrying out some class learning activities though mobile learning .....	63
Table 13: Third-year students’ willingness to purchase hardcopy or electronic format textbooks to study from .....	64
Table 14: Third-year students’ willingness to use either hardcopy or electronic format textbooks during open-book assessments .....	65
Table 15: Third-year students’ opinion of building the cost of an Apple iPad into their tuition fees .....	65
Table 16: Gender correlation of third year students’ interest in engaging with a mobile learning environment .....	67
Table 17: Correlation between the fourth-year male and female students and the educational uses for which they apply their mobile device .....	69
Table 18: The change in students’ interest in engaging with mobile learning .....	72
Table 19: Paired Sample t-test for Question 14 in Questionnaire (i) compared to Question 3 in Questionnaire (ii) .....	73

Table 20: Paired Sample t-test for Question 15 in Questionnaire (i) compared to Question 4 in Questionnaire (ii) .....	75
Table 21: Paired Sample t-test for Question 16 in Questionnaire (i) compared to Question 5 in Questionnaire (ii) .....	77
Table 22: The change in students' views on whether the University should consider building the cost of an Apple iPad into the tuition fees .....	79
Table 23: Paired Sample t-test for Question 17 in Questionnaire (i), compared to Question 6 in Questionnaire (ii) .....	79

## ABBREVIATIONS

The following abbreviations as listed in Table 1 were used in this study:

**Table 1: Abbreviations used in this document**

<b>Abbreviation</b>	<b>Meaning</b>
BCom	Baccalaureus Commercii
E-book	Electronic book loaded in soft copy on an electronic device
E-reader	Electronic reader. A mobile device suitable for reading e-books loaded on the device
SAICA	South African Institute of Chartered Accountants
SAIT	South African Institute of Tax Professionals
Taxation 300	Core Taxation subject for third-year students
Taxation 700	Core Taxation subject for Honours students studying towards becoming chartered accountants
Taxation 760	Core Taxation subjects for Honours students studying towards becoming tax professionals
UP	University of Pretoria

# **MOBILE DEVICES: TAXATION STUDENTS' PERCEPTIONS AND ACCEPTANCE OF ENGAGING WITH A MOBILE LEARNING ENVIRONMENT**

## **CHAPTER 1 INTRODUCTION**

### **1.1 BACKGROUND**

The saying “An apple a day keeps the doctor away” has new meaning these days, with students and educators dreaming of an electronic Apple iPad instead of the fruit (Vlok, 2012:22). Media consumption is increasing rapidly, with the use of mobile devices pushing industries to the edge (Bullas, 2011). Even the education system is under pressure to incorporate mobile devices into a learning environment (Educause Learning Initiative, 2010:1).

Mobile learning is defined as “Any sort of learning that happens when the learner is not at a fixed, predetermined location, or learning that happens when the learner takes advantage of the learning opportunities offered by mobile technologies” (O’Mally, Vavoula, Glew, Taylor, Sharples & Lefrere, 2003:6). The use of mobile devices in a learning environment is becoming more popular and includes the use of devices such as Apple iPhone, Apple iPad, Samsung tablets, smart phones, other tablets and e-readers.

According to a report released by the Educause Learning Initiative (2010:2) on mobile learning it was found that small handheld mobile devices is not a replacement for the desktop computers or laptops used in the learning environment, it is actually only adding to the learning mix. Liaw, Hatala and Huang (2010:446) support this view by emphasising that the current classroom learning approaches are not fully replaceable by learning on mobile devices, it only enriches the student’s learning experience.

The technology of mobile devices has improved to such an extent over the past 25 years that they are not only used to make phone calls any more, but are used to send text messages, do video calling, play games, access the internet, and view photos and videos

(Barry, 2011). Mobile devices are even used as a learning aid in learning and teaching environments (Banister, 2010:129). According to Brand and Kinash (2010:147), new approaches to teaching and learning are achieved by making use of mobile devices in the learning environment. Studies have shown that incorporating these handheld devices as an educational tool has great value for teaching and learning (Banister, 2010; Wang, Shen, Novak & Pan, 2009).

A student can use his/her mobile device to perform more than one task at the same time (Barry, 2011). This multi-functionality can enhance the student's learning experience. More and more students are "consuming information on the go" just by using mobile devices in a more interesting and innovative way (University of the Witwatersrand, 2011:1). Mobile devices such as e-readers can store thousands of books and textbooks; making it possible for students to carry around their own "library" everywhere they go (Lai & Chang, 2011:572).

Since students are already comfortable with the use of these devices outside the classroom (Educause Learning Initiative, 2010:7), implementing the use of these devices in the classroom would still be within the students' comfort levels. Since the current generation of students are "technically savvy and enthusiastic about any project involving technology" (Educause Learning Initiative, 2010:7), implementing the use of mobile devices into the learning environment would make learning more interactive and fun (Liaw *et al.*, 2010:453). The use of mobile devices enables students to gain new knowledge and to share this knowledge with other users in a more interesting and enjoyable way, making learning more fun (Wang *et al.*, 2009:674). Students are also more positive about and involved in their studies because of the enhancement of teaching and learning through the use of a mobile learning environment (Fahad, 2009:118).

Several studies have been undertaken to ascertain students' perceptions of the use of mobile devices during their studies, and of the benefits and challenges associated with the use of these devices, what students perceive mobile learning to be and the factors that would influence students' acceptance of engaging in a mobile learning environment (Baya & Daher, 2009; Brand & Kinash, 2010; Campbell, 2006; Croop, 2008; Fahad, 2009; Liaw *et al.*, 2010; Wang *et al.*, 2009; Wang, Wu and Wang, 2009).



No formal research has been found on the views and perceptions of students regarding the use of mobile devices in the field of Taxation in South Africa. In brief, no formal research on this topic exists regarding students studying to become tax professionals or chartered accountants in South Africa. Oberholzer (2008:45) states that “One of the most effective tools for making people more positive is to empower them with knowledge”, and it is expected that the use of these mobile devices as an educational tool in taxation classrooms might just achieve that. It is therefore important to investigate Taxation students’ acceptance of and willingness to engage with a mobile learning environment at the University of Pretoria.

## **1.2 RATIONALE FOR THE STUDY**

Although some researchers (Baya & Daher, 2009; Brand & Kinash, 2010; Croop, 2008; Fahad, 2009; Liaw *et al.*, 2010; Wang, Wu & Wang, 2009) have studied the perceptions of learners regarding the use of mobile devices in the classroom in Israel, Sydney, America, Saudi Arabia, China and Taiwan respectively, it was noted that no study exists on the behaviour and perceptions of South African students regarding the use of mobile devices, specifically in the field of Taxation. The aim of the study was to determine whether South African university students in the field of Taxation are willing to engage with a mobile learning environment.

Currently South Africa has a shortage of skilled professionals in the areas of Accounting and Finance (The Skills Portal, 2011). Improving the basic education system and adapting lecturing styles may be one means of increasing the number of students with Accounting, Taxation and Finance skills. Universities should strive to equip 21st century students with the knowledge they need to achieve success in their 21st century careers (Nelson, 2008:8).

## **1.3 PURPOSE STATEMENT**

The main purpose of the current study was to evaluate students’ acceptance of and willingness to use mobile devices in the field of Taxation and to determine whether students prefer a mobile learning environment in which they use a mobile device as a sort

of e-reader. Further, the study aimed to determine whether students' acceptance of and willingness to engage in mobile learning have changed over a given period.

## **1.4 RESEARCH OBJECTIVES**

The study was guided by the following research objectives.

- To analyse previous research studies and literature on mobile learning in order to establish the theoretical basis for this study.
- To evaluate students' perceptions of what they believe "mobile learning" to be.
- To determine whether students are willing to engage with a mobile learning environment.
- To evaluate a possible change in acceptance towards and willingness to engage with a mobile learning environment over two different years of study.

## **1.5 HYPOTHESES**

The hypotheses of this study are:

- Students, when given the opportunity, will usually respond more positively towards engaging with a mobile learning environment.
- There is a difference in levels of acceptance towards engaging with a mobile learning environment between males and females.
- Students will show a positive change in acceptance towards and willingness to engage with a mobile learning environment as they become more familiar with their specific learning environment.

The results of the hypotheses are discussed in Chapter 5.

## **1.6 REPLICATION OF PREVIOUS STUDIES**

The study will in some instances replicate the study of Croop (2008). The comparison between this study and Croop's (2008) study is discussed below and illustrated in Table 2.

Croop's (2008:57) main aim was to gather information to assist lecturers in deciding what approach is necessary to incorporate and support mobile learning. Croop (2008) obtained the results by means of an electronic questionnaire emailed to all students registered at the higher education institution in the autumn of 2008. The researcher used four statements where students were asked to respond, *yes*, *no*, *not sure*, or *no response* in giving their opinion on what they believed mobile learning to be. The researcher also used a five-point Likert scale with the options *strongly agree*, *agree*, *undecided [neutral]*, *disagree*, and *strongly disagree* for three questions relating to the respondents' perception of and willingness to make use of mobile learning. Lastly, Croop (2008) included three open-ended questions to obtain the respondents' perceptions of the advantages, disadvantages and barriers they attach to mobile learning. This questionnaire was followed by a focus group session. Students who completed the questionnaire were invited to participate voluntarily in a follow-up focus group in order to enable the researcher to gain an understanding of students' perceptions of mobile learning in higher education.

The current study duplicated some of the questions used in the questionnaire for Croop's (2008) study. These duplicated or similar questions can be found in Questionnaire (i) (see Questions 8, 9, 10, 14, 35 and 36 in Annexure A, p. 98). The complete questionnaire design is discussed in Section 3.4.2.

The following table sets out the similarities and differences between the current study and Croop's (2008) study.

**Table 2: Comparison between this study and Croop's (2008) study**

<b>Current study</b>	<b>Croop (2008)</b>
University of Pretoria, South Africa.	Small private higher education institution founded by the Religious Sisters of Mercy and located in Northeastern Pennsylvania, United States of America.
Compulsory Taxation module	Every student on campus.
Male and female undergraduate (in 2012) and postgraduate (in 2013) students between the ages of 20 and 25	Male and female students between the ages of 14 and 62. However, 73 of the students invited to participate were older than 62.
Longitudinal research method. This study	Mixed research method. Quantitative and

<p>is primarily classified as quantitative in nature although the questionnaire contained open-ended questions.</p>	<p>qualitative data were obtained through closed-ended and open-ended questions. The focus groups also provided qualitative data.</p>
<p>Questionnaires were used for data collection and were in English.</p>	<p>A questionnaire and focus groups were used for data collection. The questionnaire administered and the focus groups conducted in English.</p>
<p>The first questionnaire was handed out during the Taxation 300 lecture on 2 November 2012. All students attending the lecture that day were invited to participate in the study.</p>	<p>The first phase of the researcher's study was an electronic questionnaire emailed to all students registered at the education institution in the autumn of 2008 (September – November). The questionnaires were emailed to 2 515 students who were invited to participate.</p>
<p>A follow-up questionnaire was handed out to the same group of students during the Taxation 700/760 lecture on 31 July 2013. This enabled the researcher to investigate changes in willingness to accept a mobile learning environment.</p>	<p>The second phase was a follow-up focus group session. Students who participated in the first phase were invited to participate in the focus group. Candidates were chosen out of those who indicated that they were willing to participate in the second phase.</p>
<p>Students could only participate in this study on the given dates, when the questionnaire was handed out to them during the lecture. No other times were made available.</p>	<p>The students had 17 days to respond to the invitation emailed to them. The students were notified on bulletin boards that they should attend to the email and reminded twice by email during this 17-day period to participate.</p>
<p>No incentives were provided to encourage students to participate in filling out questionnaires (i) and (ii).</p>	<p>No incentives were offered for students to participate in the electronic questionnaire; however, students who were willing to participate in the follow-up focus group received a \$20 voucher.</p>
<p>Questionnaire (i) contains similar questions to those in the questionnaire used in Croop's (2008) study. These questions were not an exact replication of Croop's (2008) questions since the South African context was kept in mind and technologies have improved since Croop's (2008) study.</p>	<p>Questions 1, 2, 3, 5, 8 and 9 of the researcher's study were used in the current study.</p>
<p>The analysis was based on replies</p>	<p>638 completed surveys were received,</p>

received from approximately 400 students who completed the first questionnaire and 267 students who completed the second questionnaire. 189 students completed both questionnaires.	representing 25% of the target population of 2 515 students. Of the 638 participants, 34 were invited to join in the focus group.
A pre-test was conducted a week before the questionnaires were distributed to the participants. An independent research consultant and two senior lecturers reviewed the questionnaires.	A pilot test was conducted in which 5 students were asked to complete the questionnaire in the laboratory. A discussion followed afterwards on the manner in which the questionnaire had been set. These 5 students received a \$25 gift certificate as a reward for participating.
Mobile devices: Apple iPad, Apple iPhone, tablets, e-readers, and smart phones.	Mobile devices: The use of wireless laptop computers, PDAs and cell phones.

The current study was carried out in a different context, however, and had a smaller target population. The perceptions of South African students could be influenced by factors which are specific to South Africa, such as poverty, possible lack of quality education and language barriers. The conclusions reached may well be different from those of Croop's (2008) study. The current study also differs from Croop's (2008) study in that the current mobile technologies available have improved significantly since 2008.

## 1.7 IMPORTANCE AND BENEFITS OF THE CURRENT STUDY

The current study focused on the educational benefits of implementing a mobile learning environment. The researcher began by ascertaining students' attitudes towards mobile learning and establishing whether the educational system should consider a mobile learning environment. Mobile learning could, however, also hold environmental benefits for our planet.

### 1.7.1 Educational benefits

A 21st-century student's world consists of new technologies and mobile devices. According to Dr Lieb Liebenberg, it is unthinkable to try to educate students using outdated learning environments while it is second nature to them to use these technologies and mobile devices. It is sensible to employ these new technologies and mobile devices to

get students' attention, since students' interest is aroused immediately and technology is part of their daily lives (Liebenberg interviewed by Rademeyer, 2012:8).

Students walk around with cell phones (and other mobile devices) and most of these devices are powerful enough to be used as a study aid (Kobus Van Wyk, interviewed by Lamprecht, 2012:1). The use of mobile devices in classrooms is not limited to the use by the lecturer; giving students the opportunity to explore the world of education by using these mobile devices themselves might have an influence on their perceptions of learning in general (Banister, 2010:121).

As discussed in Schmulian (2008:33), students feel that attending lectures is important as it adds value to their learning experience. The author offers the following suggestion: "Lecturing styles should rather be adapted, taking into consideration the changes that occur in the technological environment, to accommodate and facilitate a continuously improving learning experience." It is therefore expected that the use of mobile devices by students will not only have an effect on students' achievements but might also increase lecture attendance since students might view lectures as being fun, enjoyable and not boring (Croop, 2008:107; Wang, Wu & Wang 2009:114)

The majority of studies on the use of mobile devices by students during their studies have been performed in the fields of English, Medicine, Islamic culture, Mathematics, Accounting etc. (Baya & Daher, 2009; Croop, 2008; Fahad, 2009; Liaw *et al.*, 2010). No study was found on the subject of perceptions of mobile learning in the field of Taxation. Ylijoki (2000:355) argues that students' attitudes differ among different academic departments as a result of differences in their academic thinking. Therefore, students' perceptions may differ from one academic discipline to the next and research might be needed to ascertain the perceptions of the use of mobile devices by students in the field of Taxation.

Since the South African education system is continuously evolving, it is important to determine students' willingness to use mobile devices as an educational tool in loading and reading electronic textbooks (e-books). Mobile devices such as e-readers provide

convenience, media richness and compatibility with hardcopy books, which all contribute to the acceptance of readers to make use of e-readers (Lai & Chang, 2011:558).

Research has shown that the use of e-books is increasing, with the result that print volumes are being reduced, which could lead to the extinction of hardcopy books in the near future (Cancio, n.d.; Dewan, 2012:27; Thayer, Lee, Hwang, Sales, Sen & Dalal, 2011:2917). However, Bowen (2013) finds that the majority of readers still prefer a hardcopy book since reading and touching the hardcopy book involves all five senses, providing greater stimulation than an e-book does. Readers who prefer e-books say they are more convenient, especially while travelling; it is cheaper and takes up less shelf space.

Students' perception and acceptance of mobile learning and e-books are a critical factor to consider if a mobile learning environment is to be successfully implemented (Wang, Wu & Wang *et al.*, 2009:92). Acceptance of mobile learning by students will also increase when educators learn how to integrate the use of these mobile devices into their teaching and learning (University of the Witwatersrand, 2011:1).

Several researchers agree that educators should take up the challenge of providing a mobile learning environment to evaluate the effect it has on teaching and learning and that the finding should be documented (Banister, 2010:129; Baya & Daher, 2009:86; Croop, 2008:56). Mobile technologies are developing fast (Traxler, 2007:3) and it is therefore inevitable that the possible educational influence mobile devices can have in a learning environment will be investigated. The results will improve our understanding of educational efficiency when making use of these mobile technologies in teaching and learning.

The current study could make a valuable contribution to the teaching and learning environment by evaluating the current lecturing system and determining whether lecturing styles should be adapted to implement the use of mobile devices in the field of Taxation. Although it might be difficult and risky to implement the use of mobile devices, Educause Learning Initiative (2010:7) strongly suggests that this should not be the reason for not making use of these devices in education as a way of moving forward.

## **1.7.2 Environmental benefits**

We are constantly reminded to “be mindful of and sensitive to the natural environment in [our] daily life” by reducing our waste consumption (Go-Green Initiative, n.d.). Go Green Initiative (n.d.) suggest that waste can be reduced by limiting printing; for example, editing can be done on screen and documents saved electronically instead of printing them on hardcopy.

There are mobile applications (apps) available that turn mobile devices into a “green sidekick” (Smusiak, n.d.) in order to promote the conservation of nature and our environment. This can be achieved by reducing printing and making documents and class notes available in a format that students can access by using their mobile devices, such as an Apple iPad, any tablet, e-reader or any other mobile device.

The University of Pretoria recently launched its mobile application (UP Mobile App) (Tsunke, 2012). With the aid of this application students can access the University’s web system easily and quickly in order to download their notes on their mobile device (Jordaan, 2012) which contribute in minimising printing volumes.

## **1.8 DELIMITATIONS AND ASSUMPTIONS**

The delimitations and assumptions of the study are discussed below:

### **1.8.1 Delimitations**

The following delimitations underpinned the current study:

- The target population used as a basis for establishing students’ acceptance of and willingness to engage with a mobile learning environment consisted of third-year undergraduate Commerce students registered for a specific taxation module in 2012. These students were surveyed again in their fourth year (post-graduate Commerce) in 2013. The reason for including the last-mentioned target population in the study was to investigate a change in acceptance and willingness regarding mobile learning. The study was limited to the acceptance of Taxation students studying at the University of



Pretoria. Only BCom students with Taxation as a subject were included in the sample; no other students studying at the University of Pretoria were included.

- The study focused on the acceptance of the Taxation students as a group, with gender and the language in which the subject is taken by the participants as the demographic characteristics discussed in the study. Since the students are all around the age of 20–25 (third-year and fourth-year students), age was not one of the demographic characteristics.
- The study focused on whether there was a change in acceptance as a result of the students' becoming more familiar with the use of mobile devices and more familiar with their specific learning environment, especially open-book assessments. The aim of this study is to determine whether students will welcome the use of electronic textbooks during open-book assessments.
- The study analysed the use and perception of mobile devices as an educational tool in the field of Taxation at undergraduate and postgraduate levels. The study only focused on the use of mobile devices by students and not by educators.

### **1.8.2 Assumptions**

The following assumptions applied to the current study:

- The data were based on information gathered from questionnaires. However, there is absolutely no assurance that the participants answered the questions truthfully.
- To guarantee that participating students would not be influenced when answering questions, the objectives of the study were clearly explained to them.
- Participants may have had a different perception of the use of mobile devices in their third year compared to their fourth year.
- The information gathered from the participants' answers was reliable and sufficient to enable the researcher to reach a proper conclusion.

## 1.9 DEFINITION OF KEY TERMS

The key terms used in this study are defined as listed in Table 3 below:

**Table 3: Definitions of key terms used in this study**

Key term	Definition
Acceptance	“The action of consenting to receive or undertake something offered” (Oxforddictionaries, n.d. <sup>a</sup> )
E-book	Electronic book loaded in soft copy on an electronic device, such as an e-reader or Apple iPad.
E-reader	Electronic reader. A mobile device suitable for reading e-books loaded on the device.
Fourth year	The fourth year of studies refers to the BCom Honours year (post-graduate Commerce) Students who were in their fourth year in 2013.
Mobile devices	For purposes of this study the term mobile device includes Apple iPad, Apple iPhone, tablets, e-readers and smart phones.
Mobile learning (M-learning)	“Any activity that allows individuals to be more productive when consuming, interacting with, or creating information, mediated through a compact digital portable device that the individual carries on a regular basis, has reliable connectivity, and fits in a pocket or purse” (eLearning Guild in m-learning, n.d.), or “The exploitation of ubiquitous handheld technologies, together with wireless and mobile phone networks, to facilitate, support, enhance and extend the reach of teaching and learning” (MoLeNet in m-learning, n.d.).
Perception	“The ability to see, hear, or become aware of something through the senses” and “the way in which something is regarded, understood, or interpreted” (Oxforddictionaries, n.d. <sup>b</sup> ).
Student(s)	“Student” for the purposes of this study refers to a taxation student at the University of Pretoria.
Third year	The third year of studies refers to the final year in the undergraduate Commerce programme. Students who were in their third year in 2012.
Willingness	“The quality or state to be prepared to do something” (Oxforddictionaries, n.d. <sup>c</sup> ).

## 1.10 SUMMARY

This chapter discusses the importance of improving the teaching and learning environment. The chapter also focuses on evaluating a mobile learning environment in order to provide the background and rationale for the study. The problem statement, research objectives and importance of the study are discussed, and this is followed by the delimitations and assumptions of the study. A comparison between this study and that by Croop (2008) is also explored in detail. Lastly, key terms are defined.

The next chapter contains the literature review which forms the theoretical basis for this study. This next chapter focuses on how mobile learning can be defined and the opportunities and challenges associated with mobile learning. It also focuses on measuring students' acceptance of a mobile learning environment and willingness to use mobile devices as some sort of e-reader during open-book assessments. Lastly, it examines the mobile support offered by the University of Pretoria which can help to implement a mobile learning environment successfully.

Chapter 3 discusses the research design and methodology which applies to the current study. Sample size, data collection method, questionnaire design, pre-testing, errors associated with this study and research ethics are also discussed. In Chapter 4, the data obtained are analysed, and the results of the analysis are illustrated and discussed. The last chapter discusses the conclusions drawn from the data analysis, the results of the hypotheses, and the contribution of the current study. Lastly, the chapter provides suggestions for future research.

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.1 INTRODUCTION**

In Chapter 1 the importance of incorporating a mobile learning environment as a possible means of improving the teaching and learning environment is discussed. The chapter focused specifically on evaluating the current teaching and learning environment and on whether educators should think about incorporating a mobile learning environment.

The purpose of this section is to provide a critical and synthesised summary of students' acceptance of using mobile devices during their studies. A review was carried out of previous literature published in various educational fields on the use of mobile devices as an educational tool and the perceptions of the students who used such devices.

The chapter looks at the meaning attached to the term “mobile learning” and further explores the opportunities and challenges associated with mobile learning. Particular attention is given to the willingness students show to engage with a mobile learning environment. The chapter also looks at students' attitude towards open-book assessment to try to establish whether students would make use of e-readers and e-books during assessments instead of the hardcopy textbooks. Lastly, it looked at the mobile support offered by the University of Pretoria to assist in successfully implementing a mobile learning environment.

This chapter also contributes towards ensuring that the research objectives are met and determining whether the hypothesis is supported or not.

#### **2.2 OVERVIEW OF MOBILE LEARNING**

The arrival and incorporation of mobile devices has had a major impact on education, especially regarding the use of these devices as learning aids by students. Although mobile devices have been around for many years, the use of these devices in education

and as learning aids are still new and in some areas still imperfectly understood (Wang *et al.*, 2009:677).

### **2.2.1 Mobile learning defined**

Mobile learning is not a new concept since learning on the move has always been a part of our daily lives (Laouris & Eteokleous, 2005:1). Learning has always been mobile in the sense that users carry information around in their brains (Laouris & Eteokleous, 2005:1). The use of textbooks that are carried with the student is also a form of mobile learning (Croop, 2008:16) and students have always had the ability to study while on the move.

Most educators and researchers understand mobile learning to be the immediate successor of e-learning (Laouris & Eteokleous, 2005:2). E-learning is defined by Clark and Mayer (2011:7) and Garrison (2011:2) as learning with the aid of digital wireless devices. Mobile learning is therefore clearly taking e-learning to a new level. Mobile learning is compatible with environment- and time-independency whereas e-learning is still compatible with being in the classroom or in an internet laboratory (Laouris & Eteokleous, 2005:3). The switch from e-learning to mobile learning and the advantages and possibilities for mobile learning that emerge have prompted researchers to find an appropriate educational definition of mobile learning (Laouris & Eteokleous, 2005:7).

According to Croop (2008:25), no uniform definition of mobile learning exists as some researchers place the emphasis of the term mobile learning on the mobility of the electronic device (O'Mally *et al.*, 2003:6) and others place the emphasis on the fact that the learning environment is mobile (Fahad, 2009:112; Laouris & Eteokleous, 2005:5; Sharples, Taylor & Vavoula, 2005:8; Traxler, 2007:1). Recent studies have indicated a narrower definition of what it is to be mobile (Croop, 2008:19). In contrast Croop (2008:21) formulates a definition of mobile learning where mobile learning is not attached to any mobile technologies but refers instead to the mobile learning initiatives which are described as follows: "mobile learning is learning supported by wireless access to information resources such as those available on the internet and wireless communication with learning collaborators that can take place in a location that is most conducive to achieving learning outcomes".

Croop (2008:42) suggests that mobile devices such as tablets can be used to facilitate mobile learning. Most of the recent definitions of mobile learning, relate to the use of movable electronic or so-called handheld devices in a learning environment (Liaw et al., 2010:446; Wang, Wu & Wang, 2009:92).

From the above the current study has adopted the following definition to explain the term mobile learning: *Mobile learning refers to the use of mobile, handheld devices such as e-readers in a learning environment.* The focus of mobile learning therefore falls on the device and on whether the students are willing to use such mobile devices as educational tools.

The next section focuses on the opportunities provided by mobile learning. These opportunities may influence a student's behaviour regarding mobile learning and his/her interest in engaging with a mobile learning environment.

### **2.2.2 Opportunities afforded by mobile learning**

Many researchers have written about the opportunities and limitations of implementing a mobile learning environment; some have focused on the device and others have focused on the learning environment. Mobile learning can achieve numerous educational tasks as a learning support tool (Keegan 2005:85).

The following opportunities have been identified from previous research:

- *Anywhere, anytime learning:* Mobile learning gives students a sense of freedom since they can study anywhere and at any time (Baya & Daher, 2009:84; Dewan, 2012:27; Fahad, 2009:112; Keegan 2005:85; Lai & Chang, 2011:573). Mobile learning through mobile devices enables students to learn more efficiently since a mobile device is not fixed at a specific location (Croop, 2008:16) but is portable instead and can be taken along every day.
- *Distance learning:* The improved technologies that exist today have caused a world-wide movement in distance learning by giving students studying at a distance with the tools they need to get an education anywhere in the world. This enriches the students'

learning environment by delivering information on time and at a time that suits the students (Fahad, 2009:111).

- *Independence*: Students can access data and information quickly and easily and this allows them to work independently (Fahad, 2009:118; Keegan 2005:85; Liaw *et al.*, 2010:447).
- *Effortless communication*: Since mobile devices have wireless connectivity (Thayer *et al.*, 2011:2917) the student can view announcements and communicate with the lecturer or fellow students without difficulty (Educause Learning Initiative (2010:9). This allows the shy student to participate in the discussions as well (University of the Witwatersrand, 2011:1).
- *Assists disabled persons*: Mobile devices increase the learning ability of a disabled person or a student with a learning disability (Keegan, 2005:85) since a mobile device can “claim the role of an organ” and has the ability to assist a physically disabled person by “lending them an invisible body” (Laouris & Eteokleous, 2005:3).
- *Saves space*: Mobile devices require less space in a classroom and students are no longer hidden behind bulky desktop computers (Keegan, 2005:85).
- *Lightweight*: Mobile devices are lightweight and easy to carry around as opposed to heavy school bags filled with textbooks or laptops (Dewan 2012:28; Keegan, 2005:85).
- *Saves time and effort*: The use of mobile devices and e-books saves time and effort (Lai & Chang, 2011:573). The bookmark capability of e-readers allows the student to jump to required pages effortlessly (Nelson, 2008:1). E-books can be purchased within seconds from anywhere in the world and there is no need to visit bookstores anymore (Dewan 2012:28).
- *Compatible*: Mobile devices such as e-readers allow the user to customise font size, look up words in the inbuilt dictionary and customise pages, all of which contribute to improving the user’s learning experience (Dewan, 2012:29&35).
- *Motivation to learn*: Mobile learning increases students’ motivation to learn and teaches them responsibility for effective learning. The ability to “own” a mobile device teaches and encourages responsibility among students not only for educational purposes but for personal growth as well (Baya & Daher, 2009:84; Keegan, 2005:85). Students also become more involved in the learning process through the use of mobile devices (Fahad, 2009:118; Wang *et al.*, 2009:674), since learning is made interactive and fun (Baya & Daher, 2009:85; Keegan, 2005:85; Liaw *et al.*, 2010:447).

It is clear that the use of mobile technologies changes the way in which learning and knowledge are delivered, as Traxler (2007:5) points out: “Learning that used to be delivered just-in-case can now be delivered just-in-time, just-enough and just-for-me”, with the student taking responsibility for his/her own leaning environment.

### **2.2.3 Challenges associated with mobile learning**

From the previous research it is clear that mobile learning creates numerous opportunities; however, there are some challenges associated with mobile learning, making students hesitant to accept a mobile learning environment. The following challenges were identified:

- *Change is difficult:* Most students are used to hardcopy textbooks and find it difficult to switch to e-books and a mobile learning environment (Nelson, 2008:2).
- *Not always compatible:* Some e-books make it difficult for users to jump to certain required pages since the table of contents is not hyperlinked. Some platforms do not allow the user to highlight certain text and make notes or bookmark certain areas, all of which are necessary in academic work (Dewan, 2012:29), especially to help the student in open-book assessments.
- *Small:* Mobile devices have small screens which limit the viewing space and the student has to scroll continuously to obtain all the relevant information (Educause Learning Initiative, 2010:2-10; Keegan, 2005:86). However applications are now designed in such a way that this small screen can be used to the best advantage, resulting in an easier and simpler interface (Educause Learning Initiative, 2010:2-10).
- *Theft:* Mobile devices are small and easy to steal. The device can also be easily misplaced or lost (Keegan, 2005:86).
- *Expensive updates:* The device and programs might need regular updates, which are expensive (Dewan, 2012:29; Keegan, 2005:86).
- *Lack of knowledge:* Students might not have the expertise to use such devices to their advantage as a study aid. Some students might also be reluctant to use these devices since they cannot see how using them would support their learning experience, especially if they find it difficult to operate these devices (Educause Learning Initiative,



2010:2-10). To use these mobile devices correctly and successfully requires continuous training (Keegan, 2005:86).

- *Lack of attention:* Instead of the students' listening to a lecture their attention might be occupied by the device, making educators hesitant about implementing the use of these devices in their specific subject (Educause Learning Initiative, 2010:2-10).

Even with all the “educational” limitations students and educators face, it is impossible to forbid students to bring mobile devices to a lecture (Educause Learning Initiative, 2010:3). Educators should rather consider introducing the use of these devices into their teaching and learning in an enjoyable and effective way to ensure students pay attention and participate in the lecture (Wang *et al.*, 2009:674).

### **2.3 SUCCESSFUL IMPLEMENTATION OF MOBILE LEARNING**

Modern tax professionals need to be computer literate in order to apply their knowledge in using critical thinking to solve tax problems (Engelbrecht, 2005:217). Permitting students to use mobile devices in the classroom and during exams allows them to take responsibility for their own learning environment (Wang *et al.*, 2009:692). However, Engelbrecht (2005:217) argues that giving students this responsibility “poses a bigger challenge” for educators than for the students. Educators are faced with implementing an effective teaching and learning environment that will shape lifelong learners (Engelbrecht, 2005:227). This can lead to several problems if not done correctly and efficiently.

Since a well-developed mobile learning environment is based on the perspective that the students can easily “find, retrieve, manage and share knowledge” on any mobile device (Liaw *et al.*, 2010:453), educators need to design a mobile learning environment that is not complex and is easy to administer (Banister, 2010:122). Although mobile devices can be a distraction in classrooms, their educational importance should not be ignored but instead educators should explore the educational benefits of mobile devices (Campbell, 2006:291) in implementing such devices as an educational tool.

However, it is beyond the scope of this study to evaluate the successful implementation of mobile devices as a learning aid. It is important to first establish whether students are

willing to engage with a mobile learning environment before experimenting with mobile devices in a learning environment.

## **2.4 STUDENTS' WILLINGNESS TO ENGAGE WITH A MOBILE LEARNING ENVIRONMENT**

It is important to investigate the possible challenges that could influence the successful implementation of mobile learning in higher education (Fahad, 2009:111). In order to succeed, educators need to consider factors such as students' acceptance level, teacher acceptance level, the specific learning environment and the mobile technologies available (Banister, 2010:122; Baya & Daher, 2009:85; Wang *et al.*, 2009:693).

Attitudes towards mobile learning may differ between educators and students because of the different roles they play in the learning environment (Campbell, 2006:282). It is necessary to investigate perceptions of, attitudes towards and acceptance of a learning system before implementing and designing the new learning approach (Liaw, Huang & Chen, 2007:1077). Although the attitudes and acceptance of both lecturers and students are important in determining whether mobile learning is effective, the focus of this study is on the students.

### **2.4.1 General acceptance towards mobile learning**

Accepting a mobile learning environment requires effort and both students and lecturers need to participate to ensure that the use of mobile devices contributes positively to the students' learning experience (Educause Learning Initiative, 2010:7). Educators' attitudes and recommendations overall influence students' acceptance of e-books and a mobile learning environment (Nelson, 2008:7). The more optimism educators display regarding e-books and mobile learning, the easier it is for students to accept this modern mobile learning environment (Baya & Daher, 2009:82).

Allowing students to participate in mobile learning and encouraging them to explore mobile learning will lead to students' accepting a mobile learning environment since it can provide immediate support and flexibility, improve communication between student and

lecturer and provide new opportunities for learning (Croop, 2008:140; Fahad, 2009:118; Liaw *et al.*, 2010:446). Students voluntarily engage in the learning process when given the opportunity to use mobile devices in the learning environment (Wang *et al.*, 2009:693). Students “changed from passive learners to truly engaged learners” (Fahad, 2009:118).

Students are impressed by the possibilities and capabilities offered by mobile devices in a learning environment. These devices allow students to explore the learning environment and gain knowledge independently as they do not only learn from the lecturer (Baya & Daher, 2009:79-87). Students seem to enjoy this student-centred learning approach where they can take responsibility for their own learning experience instead of being tied to a classroom (Wang *et al.*, 2009:674-676,692).

It was found that students perceive mobile learning to be interactive and engaging. Overall students would like to participate in mobile learning using mobile devices since mobile learning empowers them to engage in in-depth learning and also assists them in grasping the knowledge required to complete a course successfully (Wang *et al.*, 2009:687). No significant gender differences were found when it comes to students’ interest in engaging in a mobile learning environment. Irrespective of their gender, students with high levels of interest in mobile learning will be more likely to choose to engage with a mobile learning environment than those with lower levels of interest in mobile learning (Wang, Wu & Wang, 2009:111).

Younger students and educators react more positively towards mobile devices in a classroom as they consider these modern mobile devices a necessary tool in everyday life today (Campbell, 2006:290). Students between the ages of 18 and 25 show a more positive attitude towards the use of mobile devices in a learning environment since they are confronted with these technologies from an early age and technology plays an important role in their social lives (Campbell, 2006:290).

As we are living in the 21st century and the use of mobile devices and technologies is increasing rapidly, it is certain that mobile technologies will play an important role in education now and in the future (Banister, 2010:130). Universities should strive to equip

21st century students with the tools they need to achieve success in a 21st century career (Nelson, 2008:8).

## **2.4.2 Acceptance towards open-book assessments**

Since the target population in the current study are faced with open-book examinations during their fourth year of studies and the current study aims to establish whether students would prefer to stick to hardcopy textbooks or would rather use an electronic format version accessed on a mobile device, it is important to explore the literature on open-book assessments in brief. This will provide an understanding of students' perceptions of open-book assessment, which might shed light on how students would react if they were allowed to write open-book assessments with e-books instead of hardcopy textbooks and notes.

### *Open-book assessment defined.*

Open book assessment may be defined as a form of assessment where the students have the opportunity to consult the course materials and textbook while completing the examination or assessment (Theophilides & Koutselini, 2000:379). Students are permitted to use various materials during the open-book assessment, ranging from textbooks, class notes, own notes to other relevant learning materials.

### *Students' reaction towards open-book assessments*

Students preparing for an open-book assessment study more creatively and analyse the information in greater depth before writing the open-book assessment (Theophilides & Koutselini, 2000:379). But at the same time open-book assessment makes students lazy about studying and students tend to underestimate an open-book assessment (Du Preez & Du Preez, 2012:127).

Although students perceive open-book assessments to lead only to surface learning as they tend to postpone preparation for an assessment until the last minute, students reacted very positively towards open-book assessments. Open-book assessments allow the student to search for the correct and most relevant answer to score extra marks (Du Preez & Du Preez, 2012:127). However, the student might also provide an incorrect

answer or elaborate too much, wasting time during the assessment (Du Preez & Du Preez, 2012:127).

#### *Open-book assistance*

Assistance should be provided to equip the students with the necessary skills to successfully complete open-book assessments (Du Preez & Du Preez, 2012:127). Assistance in the form of workshops, multimedia programmes, group discussions, mentorship programmes and social networking awareness programmes (Du Preez & Du Preez, 2012:134) on mobile learning could be offered to help students to understand and use the mobile learning environment more effectively and to their best advantage.

It is therefore clear that before educators can implement a mobile learning environment students and educators should obtain the proper guidance and assistance on how to successfully implement mobile learning. As suggested by Du Preez and Du Preez (2012:134), new learning approaches should be built into the curriculum. Building mobile learning into the Taxation curriculum can help the students to become more familiar with the use of mobile devices as learning aids and equip the student with the necessary skills needed (Nelson 2008:8).

### **2.4.3 Acceptance towards e-books**

Over the past few years e-readers have become more popular for leisure reading. However, the potential of e-readers in a learning environment still needs to be explored and research is needed on whether students are willing to accept the use of these technologies in their studies (Thayer *et al.*, 2011:2917). It is inevitable that e-books will take over and it is necessary to gain students' acceptance of the use of e-books in their studies (Cancio, n.d.; Dewan, 2012:27; Thayer *et al.*, 2011:2917).

People have been relying on hardcopy books for many years and printed books are still important to students and educators. However, e-books are expected to replace printed books increasingly in the near future (Dewan, 2012:27&33). Students show a significant level of interest in using e-books for study purposes, with men expressing slightly more

interest in using e-books since it allows them to be self-sufficient (Rowlands, Nicholas, Jamali & Huntington, 2007:509).

Two of the dominant preconditions for accepting e-books are convenience and compatibility with hardcopy books regarding aspects such as font type, font size and note taking. Convenience and compatibility in using e-books and e-readers will increase users' willingness to use e-books (Lai & Chang, 2011:572) and ultimately engage with a mobile learning environment where textbooks are provided in electronic format.

As technologies improve, e-books will become more popular with students and educators for use as learning aids in the place of hardcopy textbooks (Dewan, 2012:27).

## **2.5 MOBILE SUPPORT OFFERED BY THE UNIVERSITY OF PRETORIA**

In 2011 the Groupe Speciale Mobile Association (GSMA) (2011:1) reported that Africa is the second biggest mobile market and the fastest growing mobile market in the world. There is great innovation potential in applying mobile devices in education. The University of Pretoria has acknowledged that mobile devices can be of academic value to students and can be used for much more than texting and playing games. The University of Pretoria launched its mobile application (UP mobile), which is available for iPhones, iPads, Android phones and smartphones, on 24 May 2012 (Jordaan, 2012).

Although a large number of American and European universities already have a mobile application (itunes store), the University of Pretoria is the first university in South Africa with a mobile application (Jordaan, 2012). Currently 12.42% of students make use of an Apple iPad and it is expected that this number will increase with the new UP mobile app and the approximately 1 000 wireless (*wifi*) hotspots that are to be installed on campus within the next year (Jordaan, 2012). The app is available from the iTunes store or any app store for the specific mobile device. Students are now able to access the University web service system with their mobile phones from practically anywhere in the world (Jordaan, 2012).

## 2.6 CONCLUSION

This chapter discussed the term “mobile learning”, and the opportunities and challenges associated with mobile learning. This was followed by a discussion of students’ willingness to engage with a mobile learning environment. The chapter aimed to understand students’ views on and acceptance of using a mobile device as an e-reader in loading the necessary textbooks in electronic format to study from and to access during tests and examinations. This chapter concluded by looking at the mobile support the University of Pretoria offers.

The study could be of value to SAICA, SAIT and the University of Pretoria when they consider the question of allowing the students to use a mobile device for their studies and during tests and exams. It is, however, beyond the scope of this study to investigate the effectiveness of the use of mobile devices. The focus is on the students and whether they are willing to engage with a mobile learning environment.

Chapter 3 discusses the research design and methodology, the sample size and sampling method, survey method, questionnaire design, pre-testing, and errors associated with this study. The quality and rigour of the study as well as the research ethics are also discussed.

## CHAPTER 3

# RESEARCH DESIGN AND METHODOLOGY

### 3.1 INTRODUCTION

The risk and difficulty involved in successfully implementing mobile learning should not be the reason for refusing to consider a mobile learning environment (Educause Learning Initiative, 2010:7). In Chapter 2 the theoretical background of previous literature is discussed. The chapter focussed on mobile learning in general, on the opportunities it provides together with the limitations associated with mobile learning. The chapter focussed specifically on gaining an understanding of students' willingness to engage with a mobile learning environment and on assessing their attitude towards using e-books instead of hardcopy textbooks.

It is evident from previous research that most students have a positive attitude towards applying mobile devices as an educational tool. Since the literature also indicates that the successful implementation of mobile learning can offer great benefits it is important to investigate Taxation students' acceptance of and willingness to engage with a mobile learning environment at the University of Pretoria. Students' attitude towards using mobile devices as an e-reader for study and open-book purposes should therefore be researched and documented. The results might lead educators and examiners to consider implementing a mobile learning environment where students can access learning material by using a mobile device during lectures and assessments.

The current chapter will explain the research method followed to gain an understanding of students' acceptance of and willingness to engage with a mobile learning environment and apply mobile devices as an educational tool. The research objectives and hypothesis can only be effectively tested if the correct research methodology is followed. The overall research design, sampling plan and data collection methods for this study are outlined in this chapter. This chapter also discusses the process the researcher followed in meeting the outlined research objectives and testing the hypotheses that apply to the current study. This chapter concludes by discussing the techniques used to analyse the data to ensure quality and rigour as well as the research ethics that applied to this study.



### 3.2 DESCRIPTION OF OVERALL RESEARCH DESIGN

This study is a basic empirical and longitudinal study, which involves statistical analysis of quantitative primary data and which is descriptive in nature.

This study is not an applied research study since the primary purpose of this study was not to solve organisational problems or inform managerial decision making, but was rather to expand knowledge on a particular topic (Kotzé, 2013:01). This study is therefore classified as a basic research study which can add to academic research on mobile learning as a possible means of changing or improving the learning environment. Since this study is aimed mainly at explaining the research objectives, and since the research will be used predominantly by the academic community, strengthens the basic nature of this study (Saunders, Lewis & Thornhill, 2007:592).

This study is also a primary empirical research study since the researcher collected and analysed “fresh” quantitative data to answer the research problem statement and help the researcher to draw conclusions regarding the research objectives (Kotzé, 2013:01-06). The main purpose of quantitative research is to test, describe or explain theories by testing the research objectives and hypotheses. This was achieved by making use of a self-completion questionnaire that delivers primary numerical data (Cooper & Schindler, 2011:162; Zikmund & Babin, 2010:94).

This study made use of two questionnaires (see Section 3.4.2) which were distributed to the same participants on two occasions to determine how their views on and acceptance of engaging with a mobile learning environment have changed during their studies at the University of Pretoria. Kotzé (2013:05) classifies this as a longitudinal research study where the aim is to analyse or compare the data collected from the same participants over two different periods. In addition, this study is descriptive in nature, since the “purpose is to produce an accurate representation of persons, events or situations” (Saunders *et al.*, 2007:596) that have a bearing on the acceptance of students towards engaging with a mobile learning environment.

### **3.3 METHODOLOGY AND SAMPLING**

This study focused on Taxation students' acceptance towards engaging in a learning environment, using mobile devices as an educational tool. The findings of this study only focused on the acceptance of students studying at the University of Pretoria with Taxation as a core subject in their Commerce studies.

#### **3.3.1 Target population, context of study and units of analysis**

As previously explained, this study made use of two questionnaires, distributed on two different occasions. However, the target population remained the same group of participants. The target population of this study comprised students who completed their third-year Taxation module (Taxation 300) during the 2012 academic year and are currently (2013 academic year) completing their fourth-year Taxation module (Taxation 700/760). This group of participants were first surveyed during their third-year undergraduate Commerce studies (November 2012) and then again during their fourth-year postgraduate Commerce studies (July 2013).

The reason behind the choice of this target population is that the tests and the final examination for third-year undergraduate students (Taxation 300) are not open-book assessments. The students are therefore not allowed to bring textbooks or notes of any kind to help them to complete the tests and final examination successfully. Fourth-year postgraduate students (Taxation 700/760) are, however, permitted to take the SAICA Legislation Handbook into the examination room (University of Pretoria, 2013<sup>b</sup>:5). The target population included not only students who are already making use of mobile devices in their studies but also students who do not make use of such devices so that their perceptions and acceptance could also be analysed.

Since a different policy regarding open-book assessments applies in the different study years, it is submitted that the results may reflect a possible change in willingness to accept the use of mobile devices as an e-reader during the students' studies, and especially as a reference source during assessments. It was therefore decided that this target population would provide a better opportunity to analyse the acceptance of the use of mobile devices

in a learning environment, since a possible change in willingness and acceptance could be investigated with regard to the third-year undergraduate and fourth-year postgraduate policy and the increasing familiarity of students with open-book assessments.

Units of analysis refer to the people or groups from which conclusions are drawn; they do not focus on the characteristics or attributes of the people or groups being studied (University of Pretoria, 2013<sup>c</sup>:63). Based on the above-mentioned discussion, the units of analysis for this study from which conclusions were drawn are the Taxation 300 (2012) students and the Taxation 700/760 (2013) students. This study can therefore not be generalised to all students in South Africa or the rest of the world who are studying in different disciplines at various tertiary educational institutions.

### **3.3.2 Sampling methods and sample size**

The selected sampling method for the completion of the questionnaires can be described as non-probability sampling on the basis of convenience and self-selection. Non-probability sampling can be defined as a sampling technique where not all elements in a population have an equal chance of being selected as part of the targeted sample (Daniel, 2012:66). Non-probability sampling allows the researcher to answer the research question after conducting an in-depth study which focuses on a small number of cases or a single case selected for the particular study (Saunders *et al.*, 2007:226). The researcher therefore elected to include only Taxation 300 (2012) and Taxation 700/760 (2013) students to participate in the study and not all students taking Taxation as a subject at the time of the study.

The reason for only selecting Taxation 300 (2012) and Taxation 700/760 (2013) students was that this provided the most convenient sample since these students have had the experience of completing closed-book assessments in 2012 and open-book assessments in 2013. It is submitted that this target population will provide an in-depth view of the use of mobile devices such as e-readers during their studies and assessments as they become more familiar with the use of these devices and with the policy of open-book assessments.

This study is based on convenience sampling, especially for the researcher, since the target population was selected on the basis of their availability and convenience (Daniel, 2012:82). The students attended two formal lectures during a week in 2012. It was therefore convenient for the researcher to make use of one of these formal lectures to survey the students. The second questionnaire was also administered during a formal lecture in 2013. The researcher obtained the necessary permission from the Head of the Department of Taxation, Prof. Madeleine Stiglingh, to survey the students during their formal lecture on 2 November 2012 and then again on 31 July 2013. The sampling method used is further classified as self-selection sampling, since students identified for possible selection were allowed to choose whether they would like to be part of the study (by completing the questionnaires) or not (Saunders *et al.*, 2007:233).

According to the class list for Taxation 300, obtained from the UP online Management System linked to the Faculty Administration of the Faculty of Economics and Management Sciences (University of Pretoria, 2012), 552 students were registered for Taxation 300 on 2 November 2012 when the first questionnaire was administered. The aim was to have all students registered for Taxation 300 participate in this study. However, because some students were absent and others were not willing to participate on that particular day, only 400 students completed the questionnaire. The sample size amounted to 72% of the total population group when the first questionnaire was administered. This is not viewed as a deficit since the researcher still believes that valuable conclusions can be drawn from the 400 responses received. Therefore no additional opportunities to participate were given to students who were absent on the date when the questionnaire was administered.

All 400 responses were used to determine the demographic profile of the respondents, and to analyse students' views on what they believe mobile learning to be and evaluating their willingness to engage with a mobile learning environment. The results of Questionnaire (i) are discussed in Chapter 4 (see Section 4.3 and 4.4).

On 31 July 2013, the date the second questionnaire was administered, the researcher obtained a class list (containing the names of all students registered for Taxation 700/760 on this date) from the UP online Management System linked to the Faculty Administration of the Faculty of Economics and Management Sciences (University of Pretoria, 2013<sup>a</sup>).

The class list indicated that 317 students were registered for Taxation 700/760 on 31 July 2013. However, only 267 students participated in the second round; of this number 189 also completed the first questionnaire.

The second questionnaire was given to all students registered for Taxation 700/760 in 2013 since it was easier to distribute the questionnaires to the entire fourth year postgraduate class rather than to identify the students who participated in the first round individually and ask them to complete the second questionnaire as well. However, the researcher only focused on the responses of the 189 students who participated in both rounds in order to evaluate a possible change in their responses to Questionnaire (i) compared to their responses to Questionnaire (ii) (see Section 4.4). The 78 responses that were not analysed can be used for future research.

The data analysis therefore focussed on and discussed the results of the 400 students who completed the first questionnaire and the 189 students who completed both questionnaires. From the 400 responses received for Questionnaire (i), a basic demographical profile of the respondents was compiled, as well as a profile of their views on what they believe mobile learning to be and their willingness to use mobile devices during their studies. The completed questionnaires of the 189 students who participated in both rounds were analysed and compared to identify changes in their acceptance of and willingness to engage in mobile learning.

### **3.4 DATA COLLECTION**

This section discusses the survey method, the questionnaire design, pre-testing of both questionnaires, errors in data collection and data obtained from the large sample survey.

#### **3.4.1 Survey method**

This study made use of self-completion questionnaires. A self-completion questionnaire is defined as a “survey in which the respondents take the responsibility upon themselves for reading and answering the questions in the survey” (Zikmund & Babin, 2010:166). A self-completion questionnaire was used since it provides a quick, inexpensive, efficient and

accurate means of analysing data and information about the target population. Survey research and simply asking questions are the simplest way of understanding what the target population thinks about the specific topic (Zikmund & Babin, 2010:147).

However, self-completion questionnaires have some disadvantages: respondents may provide inaccurate and dishonest answers (Cooper & Schindler, 2011:249) and respondents may stop participating at any time (Zikmund & Babin, 2010:147), which can lead to inaccurate and unusable data. Although self-completion questionnaires do have some disadvantages that could influence the data collected, this was still the most viable research method for obtaining the data needed.

All students registered for Taxation 300 in 2012 and Taxation 700/760 in 2013 had a compulsory lecture scheduled for 2 November 2012 and 31 July 2013, respectively. Ethical clearance for the research (see Section 3.7.1) was obtained prior to conducting the survey on both these days. Before handing out the questionnaires on 2 November 2012 the researcher explained the purpose and importance of the study. The students were then given the opportunity to complete the questionnaire on a voluntary basis. The researcher again explained the purpose and importance of the study on 31 July 2013 prior to the second questionnaire being handed out. Again, the students were given the opportunity to voluntarily complete the second questionnaire.

A total of 400 completed questionnaires were collected on 2 November 2012 and 267 completed questionnaires were collected on 31 July 2013, of which only 189 were analysed and discussed in the research findings.

### **3.4.2 Questionnaire design**

This study made use of the longitudinal research method, as previously explained, by having the same group of students complete two questionnaires, administered at two different times. Questionnaire (i) (see Appendix A, p.98) was administered on 2 November 2012 when the students were in their third-year undergraduate Commerce studies. Questionnaire (ii) (see Appendix B, p.104) followed on 31 July 2013 when the same group of students were now in their fourth year postgraduate Commerce studies.

The survey specifically tested students' acceptance towards engaging in a learning environment where mobile devices are used as an educational tool at a South African university. Six questions were duplicated from the study by Croop (2008) which was conducted in America (see Section 1.6). The questions were adapted slightly for the specific target population and learning environment. The data collection method used in this study was therefore only partly the same as the method used in the study by Croop (2008) and is not a complete replication of Croop's (2008) study.

The survey was carefully developed to guarantee that all the research objectives for the current study were met. Questionnaire (i) included a number of questions that are not analysed and discussed in the current study but can be used for future and other research. It was more convenient for the researcher to gather data for future and other research at the time when the first questionnaire was administered rather than to schedule another date to conduct a further survey.

Both questionnaires were only made available in English, since this reduced the possibility of translation errors. It was assumed that the Afrikaans students would be able to complete the questionnaires in English.

The two questionnaires and the individual questions included in the questionnaires are discussed below. The discussion also elaborates on the reason for the inclusion of each individual question in the specific questionnaire.

### **Questionnaire (i)**

This questionnaire was designed on the basis of the six questions identified in Croop's (2008) study but included questions uniquely designed with specific reference to the current target population.

With the exception of three questions (Questions 13.1, 35 and 36), which were open-ended questions, the rest of the questionnaire consisted of closed-ended questions which instructed the students to choose from the options provided. Questions 5 and 7 allowed

the students to choose more than one option. The remaining questions instructed the students to choose only one of the options. The use of closed-ended questions ensures that the respondents consider all possible answers and it also simplifies the data analysis process (Saunders *et al.*, 2007:369).

Questionnaire (i) comprised of the following four sections and questions:

### **Section A: Demographic information.**

**Questions 1–7:** These questions were not relevant in testing the research objectives. The purpose was to establish the demographical profile of the respondent group. The gender variable was, however, used in testing the hypothesis.

- **Question 1** requested the student to write down his/her student number. The students were, however, informed in writing (consent letter, see Appendix A, p.98 and Appendix B, p.104) and verbally that their student numbers would only be used to link their responses in Questionnaire (i) with any follow-up questionnaire. The students were assured that their personal information and academic achievements would not be accessed if they provided their student numbers and that these would only be used for research purposes.
- **Questions 2–6** called for information such as gender, age, population group, how their studies are being financed and the language medium for the Taxation 300 lectures they attend.
- **Question 7** requested the students to indicate what type of mobile device they own and use.

### **Section B: Students' views on what they believe mobile learning to be**

Section B addresses the second research objective, which is formulated as follows:

- To evaluate students' perceptions of what they believe "mobile learning" to be.

Section B also tests the following hypotheses:

- There is a difference in levels of acceptance towards engaging with a mobile learning environment between males and females.



Students were presented with the following definition of mobile learning: *Mobile learning can be defined as any sort of learning that happens when the learner is not at a fixed, predetermined location, or learning that happens when the learner takes advantage of the learning opportunities offered by mobile learning* (O'Mally et al., 2003:6). Five activities were then listed and the students had to indicate whether they believed that the activity would be a form of mobile learning by indicating either "Yes", "No" or "Not sure". The five activities are listed in Table 4. The main reason for including the five activities was to determine how students view mobile learning.

**Table 4: Design of Questionnaire (i) – Section B**

Question (Statement)	Reason for inclusion of individual question in the questionnaire
<b>Question 8:</b> Using a mobile device that is connected wirelessly to the internet while outside of class in the process of completing a research paper assignment.	Similar to Question 1 from Croop's (2008) study.
<b>Question 9:</b> Using a web-enabled cell phone to read postings by other students and to post your own contribution to a discussion board that is a required activity of a class you are taking.	Similar to Question 2 from Croop's (2008) study.
<b>Question 10:</b> Using a mobile device to record observations.	Similar to Question 3 from Croop's (2008) study.
<b>Question 11:</b> Loading textbooks in electronic format to be accessed on a mobile device and read by a student on his/her way to campus on a bus or on the train.	Thayer <i>et al.</i> (2011:2917) have found that 17% of students read on the bus on their way to school or home. It is important to determine whether students view this activity as a form of mobile learning. With e-readers and e-books taking over the world and becoming more popular (Cancio, n.d.; Dewan, 2012:27; Thayer <i>et al.</i> , 2011:2917) it is important to determine whether Taxation 300 students perceive reading textbooks in electronic format as a form of mobile learning. This question also provides a basis for determining whether students would be willing to read textbooks in electronic format on some sort of e-reader.
<b>Question 12:</b> Taking a picture of lecture notes that are not made available to students in another form.	It was noted that students take pictures of lecture notes during their Taxation 300 lectures. The researcher wanted to investigate whether students view this activity as a form of mobile learning or not.

### **Section C: Students' attitudes toward using mobile devices in their Taxation module**

Section C (Question 14–17) addresses the third research objective, which is formulated as follows:

- To determine whether students are willing to engage with a mobile learning environment.

Section C also tests the following hypotheses:

- Students, when given the opportunity, will usually respond more positively towards engaging with a mobile learning environment.
- There is a difference in levels of acceptance towards engaging with a mobile learning environment between males and females.

This section consists of six main questions and two sub-questions. The questions focus on obtaining students' acceptance towards and willingness to engage with a mobile learning environment. These eight questions are listed below together with an explanation of each question.

**Question 13:** *If you own an Apple iPad, Apple iPhone or any tablet, please indicate whether you use this device for educational purposes (during your taxation lectures).*

Respondents answered by indicating either “Yes” or “No”. This question was crucial in obtaining information on whether students already make use of a mobile device during their Taxation lectures before exploring their acceptance towards engaging in a mobile learning environment.

**Question 13.1:** *If “Yes” (in Question 13), state how you are using this mobile device in the Taxation module.*

This question was an open-ended question where the student had to write down how he/she was applying his/her device for educational purposes during Taxation lectures. The researcher needed this information to establish the different methods by which the students apply their mobile devices during lectures. The researcher individually analysed the responses provided by the respondents.

The responses were then grouped, coded and analysed into two themes, namely:

- A. I use my mobile device during my Taxation lectures to load lecture material on it in order to view this material during lectures and make additional notes.
- B. I use my mobile devices to view BEL 700/760 (Taxation 700/760) announcements on ClickUP and communicate with the lecturer and fellow students.

**Question 14:** *Are you interested in the option of carrying out some of your class learning activities through mobile learning using an iPad, iPhone or tablet with wireless internet connection?*

This question is similar to Question 5 in Croop's (2008) study. Croop (2008:164) wanted students to indicate, based on a 5-point Likert scale, how much the student agreed with the statement. The current study, however, requested the respondent to indicate his/her attitude by choosing "Yes", "No" or "Not Sure".

Croop (2008: 92) found that the majority of students would like to carry out some learning activities through mobile learning. The reason for including Question 14 was to determine whether South African students would be willing to use a mobile device for educational purposes.

**Questions 15 and 16:** Question 15: *Currently BEL 300 (Taxation 300) students are required to purchase the 2 textbooks in hardcopy to study from. Please indicate whether you would rather purchase the textbooks in electronic format to be loaded on a mobile device (iPad) or whether you still prefer the hardcopy to study from.*

Question 16: *Currently BEL 300 (Taxation 300) students are not allowed to take any form of textbook into a test or exam. Next year (Honours) you will be allowed to take the Act with you into a test venue. Please indicate whether you would prefer to take in the Act in electronic format (loaded on an iPad) or still prefer to take in the hardcopy.*

For both question 15 and 16 the respondents were given the following four options to choose from:

- "Electronic format to be loaded on an iPad"
- "Hardcopy"
- "Both electronically and hardcopy"
- "Not sure"

In 2012 LexisNexis raised the question whether provision should be made for an electronic version of the textbooks for students to use (Stiglingh, 2012). E-readers are becoming more popular for use in academic work (Cancio, n.d.; Dewan, 2012:27; Thayer et al., 2011:2917). Since, Bowen (2013) found that the majority of readers prefer the hardcopy book, research is needed to determine whether the present-day student would also prefer hardcopy textbooks or would prefer the modern electronic version of books. The researcher included these two questions to determine whether students would prefer electronic version textbooks or hardcopy textbooks to study from and to use during open-book assessments. The results of these two questions will determine whether students are willing to engage with a mobile learning environment. The findings might also assist educators to negotiate with publishers to make textbooks available in electronic format.

These questions measured the students' preference for using either an electronic version of the textbook or a traditional hardcopy textbook or both an electronic version and a hardcopy textbook. Questions 15 and 16 were included in the questionnaire to determine whether the students are willing to use such electronic devices to access textbooks while studying and during open-book assessments.

**Question 17:** *Do you feel that the University of Pretoria should consider building the cost of an iPad into the tuition fees for the BCom Accountancy Sciences degree? (Each student will then receive an iPad when enrolled for this degree).*

Respondents were requested to indicate their attitude by choosing either "Yes", "No" or "Not Sure".

Both Rhodes University and the University of South Africa (Unisa) are considering building the cost of a mobile device such as an Apple iPad into the tuition fees of the students (Stiglingh, 2012). It is therefore important to determine whether the University of Pretoria should also consider building the cost of a mobile device into tuition fees. However, before such a decision can be made, students' attitude towards the matter should be investigated. Although this study was not conducted solely for the purpose of assisting the University of Pretoria in providing mobile devices to students when they enrol at the University, the study could surely assist with the decision process.

### **Questions 18 and 18.1:**

Respondents were asked whether they perceive that mobile learning will have an effect on their academic performance and how their performance is likely to be influenced. These questions were not relevant for the purposes of the current study. The data obtained will be used for future research. The reason for not analysing and discussing the results but nevertheless including the question in the questionnaire was that the researcher intended to gather results from the current respondent group in order to gain an understanding of students' perceptions before implementing a mobile learning environment and ascertain whether students perceive mobile learning to have an impact on their academic performance.

### **Section D: Students' attitudes towards mobile learning**

The last section in Questionnaire (i) focussed on the advantages and disadvantages students attach to mobile learning. Students' perceptions of the advantages and disadvantages they attach to mobile learning are analysed in this section. This section comprised 16 questions (Questions 19–34) in which the students were asked to express their views on the basis of a five-point Likert scale. The 16 questions were adapted from the study by Fahad (2009) and the findings of Croop's (2008) study. Question 35 and Question 36 were open-ended questions where the current respondent group were requested to list any further advantages and disadvantages of mobile learning not addressed in the 16 questions above. Questions 35 and 36 were also duplicated from the study by Croop (2008).

The findings of Section D are not addressed in the current findings and will be addressed in future research and extension of this study. The researcher, however, found it more convenient to include this section in the current study's questionnaire to avoid surveying the respondents again to gather information on the advantages and disadvantages they attach to mobile learning.

### **Questionnaire (ii)**

Questionnaire (ii) duplicated the questions from Section C of Questionnaire (i) (see Appendix B, p.104). Questionnaire (ii) consisted of seven closed-ended research

questions (Question 2–7.1). The focus of Questionnaire (ii) was to establish whether the current acceptance of engaging in a mobile learning environment has changed from the acceptance ascertained from Questionnaire (i). After Questionnaire (ii) was administered on 31 July 2013, the students had already completed seven (7) months of their fourth year of studies and had already gained experienced of open-book assessments.

Questionnaire (ii) comprised the following questions:

**Question 1:** Question 1 asked the students to provide their student number again. The respondents were again assured that their student numbers would only be used to help the researcher to link their answers for Questionnaire (ii) to the answers they provided in Questionnaire (i) during the previous academic year.

**Question 2:** Question 2 asked the students to indicate how they use their mobile device during their Taxation lectures by choosing the correct combination. This question is a combination of Questions 13 and 13.1 from Questionnaire (i). The themes formulated from the responses to Question 13.1 (in Questionnaire (i)) were conveyed to the respondents in Question 2 of Questionnaire (ii) as follows:

- A. I use my mobile device during my Taxation lectures to load lecture material on it in order to view this material during lectures and make additional notes.
- B. I use my mobile devices to view BEL 700/760 (Taxation 700/760) announcements on ClickUP and communicate with the lecturer and fellow students.

The respondents were then given the following options to choose from:

- “Only A”
- “Only B”
- “A and B”
- “None”

The researcher included this question to establish whether the respondents are still using their mobile device during their Taxation 700/760 lectures.

**Question 3:** Question 3 duplicated Question 14 in Questionnaire (i) (refer to discussion of Question 14, p.37).

**Question 4:** Question 4 was similar to Question 15 of Questionnaire (i) (refer to discussion of Question 15, p.37).

**Question 5:** Question 5 was similar to Question 16 of Questionnaire (i) (refer to discussion of Question 16 p.37).

**Question 6:** Question 6 duplicated Question 17 in Questionnaire (i) (refer to discussion of Question 17, p.38).

**Questions 7 and 7.1:** Questions 7 and 7.1 duplicated Questions 18 and 18.1 in Questionnaire (i) (refer to discussion of Questions 18 and 18.1, p.38).

With Questionnaire (ii) duplicating the Questions from Section C in Questionnaire (i), a possible change in acceptance and willingness to engage with a mobile learning environment can be investigated.

Questions 3–6 (Questionnaire (ii)) together with Questions 14–17 of Questionnaire (i) therefore addressed the last research objective, which is formulated as follows:

- To evaluate a possible change in acceptance towards and willingness to engage with a mobile learning environment over two different years of study.

Questions 3–6 (Questionnaire (ii)) together with Questions 14–17 of Questionnaire (i) also tested the following hypotheses:

- Students will show a positive change in acceptance towards and willingness to engage with a mobile learning environment as they become more familiar with their specific learning environment.

### **3.4.3 Pre-testing**

According to Saunders *et al.* (2007:386), the researcher needs to conduct a pre-test regarding the questionnaire that will be distributed to the participants. This pre-test minimises the possibility of the participants' misinterpreting the questions and also ensures that questions are understood as intended by the researcher. It also helps to refine the questions in the questionnaire (Saunders *et al.*, 2007:386) to ensure that the participants understand the question and provide the correct answers. It further assures the validity and reliability of the questionnaire and consequently also assures the validity and reliability of the data collected (Saunders *et al.*, 2007:606).

The pre-test was conducted a week before each of the questionnaires was distributed to the participants. Mrs Rina Owen, an independent research consultant in the Faculty of Economic and Management Sciences at the University of Pretoria, reviewed both questionnaires. After suggesting a few changes and making the adjustments to the questionnaire, Mrs Rina Owen was satisfied that the participants would be able to understand the questions in order to provide usable data.

The questionnaires were, lastly, also reviewed by two senior lecturers in the Department of Taxation at the University of Pretoria. This final reviewing process ensured that there were no grammatical errors and that the participants would be able to understand and correctly interpret each question.

### **3.4.4 Errors in data collection**

A number of errors are associated with self-completion surveys. Five of these errors that were most likely to influence this study are lack of knowledge (with regard to the use of mobile devices as an educational tool), incomplete participation, refusal to participate, extremity bias and data processing error. Participants may provide misrepresentations either deliberately or unconsciously (Zikmund & Babin, 2010:149). These misrepresentations could lead to errors in data collection and data processing which would ultimately influence the results of the study.



The five errors are discussed below:

### **Lack of knowledge error**

Because students may not be fully qualified in the use of mobile devices for educational purposes, participants might lack knowledge of the educational uses of these mobile devices and most of these participants are unable to provide the desired information (Cooper & Schindler, 2011:247). Cooper and Schindler (2011:247) further argue that the researcher can do little or nothing about the level of knowledge that the participants show on a particular subject or topic.

The Taxation core modules (Taxation 300 and Taxation 700/760) only focus on the technical content of taxation and do not explain to the students how to incorporate a mobile device as an educational tool. It is therefore submitted that lack of knowledge on how to use mobile devices in the course of their studies might possibly influence their responses towards engaging in a mobile learning environment. Participants who have little or no experience of mobile learning might respond more hesitantly towards mobile learning whereas participants who are already making use of mobile devices as an educational tool might respond more positively towards engaging in and implementing mobile learning during their studies. Students who participated in this study and who have limited knowledge of how to incorporate technology into their studies can be seen as a limitation of the study.

### **Incomplete participation and refusal to participate error**

Incomplete participation error is a form of respondent error that refers to statistical differences between a study that includes only participants who responded and a study that also includes participants who failed to respond to a specific question in the survey (Zikmund & Babin, 2010:150). It is called “incomplete” because respondents fail to respond or refuse to respond to a specific topic or question (Cooper & Schindler, 2011:246; Zikmund & Babin, 2010:150). Since participation in this study was not mandatory, incomplete response bias and refusal to participate will always be a potential problem and might ultimately influence the data collection.

The first question in both questionnaires called for the participants' student numbers. This may have given participants the impression that the researcher would access their identity and academic record. Although participants were guaranteed that the researcher would only use their student numbers for research purposes, this misperception could also lead to incomplete responses and refusal to participate. Respondents were encouraged to participate fully in order to eliminate incomplete response bias. However, this does not eliminate the error and errors in the data might still occur.

### **Extremity bias error**

Extremity bias can occur if participants misread questions or do not consider each question carefully. Zikmund and Babin (2010:152) define extremity bias as the tendency by participants to make use of extreme scale points when they respond to a rating scale question. Typically participants tend to choose "neutral", "maybe" or the "do not know" option as the easy way out. To help to eliminate extremity bias, the respondents were allowed sufficient time to read the questions and to complete the entire questionnaire.

### **Data processing error**

Data processing error occurs on the part of the researcher. Data processing error is defined as "an administrative error that occurs because of incorrect data entry, incorrect computer programming or other procedural errors during data analysis" (Zikmund & Babin, 2010:153). To avoid data processing error, the researcher designed a well-planned data-coding sheet, adopted a well-planned process for the data processing stage and repeatedly checked and verified all data processed (Zikmund & Babin, 2010:153).

## **3.5 DATA ANALYSIS**

Numerical codes were assigned to most of the questions. Numerical codes simplify the data analysis process when using a computer program such as IBM SPSS Statistics, Microsoft Excel or SASS (Saunders *et al.*, 2007:377). The coded numbers are indicated on both questionnaires handed to the respondents (see Appendix A p.98; & Appendix B, p.104).

In Questionnaire (i), Questions 13.1, 35 and 36 were not coded since the questions were open-ended and the participants had to give their opinion in writing. Question 3 was also not coded, since the participants had to write down their age instead of choosing from a given age bracket. After the data had been collected, the responses to Question 13.1 were captured, grouped, coded and analysed in the current study. The data collected from Questions 35 and 36 will be grouped, coded and analysed in future research.

Questionnaire (ii) only included closed-ended questions and participants were not required to provide any opinions in writing. Numerical codes were assigned to all of the questions in Questionnaire (ii).

The Department of Statistics at the University of Pretoria captured the data collected from the coded closed-ended questions with the aid of a Microsoft Excel Spread sheet. The Statistical Software package, SAS (version 9.2) was used by Mrs Rina Owen, an independent research consultant in the Faculty of Economic and Management Sciences at the University of Pretoria, to analyse the captured data. The researcher also made use of formulas within Microsoft Excel and IBM SPSS Statistics (Version 21) to carry out a further analysis of the captured data. Chapter 4 contains a detailed discussion of the data analysis.

The analysis and discussion of the relevant quantitative data captured were done using cross-tabulations of the different variables. In all the cross-tabulations, the data were thoroughly studied for any distinctive patterns. The following statistical tests were performed in this study:

- Chi-square test for independence
- Paired Sample t-test
- Eta Square statistic
- Kappa Measure of Agreement

These tests are discussed below:

### *Chi-Square test for independence*

The study aimed to explore the correlation between male and female students regarding their views on mobile learning and their interest in engaging with a mobile learning environment. In order to explore the correlation between two variables (males and females) the Chi-square test for independence was used (Pallant, 2011:217). The Chi-square test assisted to test the hypothesis in determining whether any gender differences exist. The Chi-square test for independence is used to compare the “observed frequencies or proportions of cases that occur in each of the categories, with the values that would be expected if there was no association between the two variables measured” (Pallant, 2011:217). The level of significance for the current study is set at 5% ( $\alpha = 0.05$ ) for the Chi-square test. If the significance value is 0.05 or smaller, the difference between the two variables is significant (Pallant, 2011:220).

### *Paired Sample t-test and Eta Square statistic*

A Paired Sample t-test was used since the researcher is interested in analysing the changes in student responses that were first surveyed in November 2012 and then again in June 2013. This test is also referred to as repeated measures since only one group of respondents was surveyed and data were collected on two different occasions (Pallant, 2011:243). Since the respondents were first surveyed before they were familiar with open-book assessments and then surveyed again after they had written a number of open-book assessments, the Paired Sample t-test was the most appropriate test to determine whether there had been a change in responses (Pallant, 2011:243). The Paired Sample t-test was done for the two different gender groups.

Once the Paired Sample t-test has been conducted and the value calculated, the test will show whether there is a “statistically significant difference in the mean scores” between the responses captured in Questionnaire (i) and those captured in Questionnaire (ii) (Pallant, 2011:244). A significant difference between the two scores is indicated when the probability (p) value of the Paired Sample t-test is less than 0.05 (Pallant, 2011:246). For each Paired Sample t-test the Eta Square statistic was also calculated to determine the effect size with the difference in responses before and after the students became familiar with open-book assessments.

The Eta Square statistic was calculated as follows where  $t$  represents the test value and  $N$  represents the number of responses:

$$\text{Eta Square} = \frac{t^2}{t^2 + (N - 1)}$$

In interpreting the effect size value, the following guidelines were followed (Cohen, 1988:284-287 in Pallant, 2011:247):

- $\leq 0.06$  = Small effect
- Between 0.06 and 0.14 = Moderate effect
- $\geq 0.14$  = Large effect

In order to use the Paired Sample t-test, the following are needed for each gender group (Pallant, 2011:114):

- “One categorical independent variable” (the two different times)
- “One continuous dependent variable” (each specific question analysed)

#### *Kappa Measure of Agreement*

The Kappa Measure of Agreement (Kappa test) was also applied. Although this test is mostly applied within the medical profession (Pallant, 2011:224), it can still be used to determine the level of agreement between the two different times when the respondents were surveyed. The Kappa test is done for the entire group in general.

The value of the Kappa test was represented as follows (Peat, 2001:228 in Pallant, 2011:226):

- 0.8 and above = Very good agreement
- Between 0.7 and 0.8 = Good agreement
- Between 0.5 and 0.7 = Moderate agreement
- Below 0.5 = Poor agreement

The distribution results, Chi-square test, Paired Sample t-test, Eta Square statistic and Kappa test are discussed in Chapter 4.

### 3.6 ASSESSING AND DEMONSTRATING THE QUALITY AND RIGOUR OF THE PROPOSED RESEARCH DESIGN

To demonstrate the quality and rigour of the research design, the measures of the questionnaire must meet two important requirements, namely: reliability and validity. According to the University of Pretoria (2013<sup>c</sup>:01), researchers use questions to measure concepts and constructs through survey studies. These measures must be reliable and valid to ensure that the conclusions drawn are not misleading or unrepresentative.

Reliability means that the data collection method is reliable in the sense that it is error free and provides consistent results (Saunders *et al.*, 2007:609). Saunders *et al.* (2007:367) also state that the reliability of a data collection method also relates to the way questions are interpreted. Participants might interpret questions in one way, whereas the researcher expected them to interpret the questions in another way.

Since the respondents knew the researcher and they had to provide their student number on the questionnaire, it is possible that the participants could have answered questions in a way that they thought the researcher wanted them to answer since they may have felt that the researcher could access their personal information and would know who they were. To eliminate this problem, the participants were assured that the student numbers would only be used for research purposes to link their views and acceptance from the first questionnaire with their views and acceptance from the second questionnaire and would not be used to access their personal information or their academic records. To further ensure reliability, participants were also informed of the importance of giving honest and complete answers.

As previously discussed, both questionnaires, which were only available in English, were reviewed by Mrs Rina Owen and two senior lecturers in the Department of Taxation at the University of Pretoria for language proficiency and to ensure that participants would understand the questions. The fact that the questionnaires were only available in English poses the risk that the Afrikaans-speaking participants might have interpreted the questions differently from the way the researcher intended. However, while the questionnaires were being completed by the Afrikaans participants, the researcher was

available to assist them by explaining and translating the questions if they were having difficulty in interpreting and understanding the question(s).

Lastly, validity means that the data collection method actually measures what it is supposed to measure and not something else (University of Pretoria, 2013<sup>c</sup>:01). The validity of the data collection method can be classified as content validity since it provides “adequate coverage of the investigative question” (Saunders *et al.*, 2007:366). “Adequate coverage” refers to the literature review and also to coverage through definitions provided in discussing the data collection method (Saunders *et al.*, 2007:366), which is thoroughly explained in this chapter. Saunders *et al.* (2007:366) also state that the investigative question refers to those questions specifically designed to answer the research objectives of the study. The validity of the questionnaire was further improved by making use of researcher/expert pre-testing (see Section 3.4.3).

### **3.7 RESEARCH ETHICS**

To ensure morality and responsibility in reporting the current research findings and to ensure that the rights of the participants would not be affected by this study, the following ethical issues were addressed (Saunders *et al.*, 2007:178-181):

- Ethical clearance from the Department of Taxation’s (University of Pretoria) Research Ethics Committee
- Privacy and anonymity of participants involved
- Informed consent and voluntary participation from participants
- Confidentiality of data obtained from the participants

#### **3.7.1 Ethical clearance from the Department of Taxation’s Research Ethics Committee**

This study involved educational research among Taxation students. For this reason the researcher only needed ethical clearance from the Research Ethics Committee of the Department of Taxation since the Department of Taxation has blanket ethical clearance from the Dean of the Faculty of Economics and Management Sciences of the University of Pretoria for any educational research with Taxation students as the participants in a study.

The researcher submitted the following information for ethical clearance to the Research Ethics Committee of the Department of Taxation for approval:

- The problem statement and research objectives of this study
- A copy of both questionnaires together with the informed consent letters

Once approval had been obtained from the Research Ethics Committee of the Department of Taxation the researcher commenced with the collection of data.

### **3.7.2 Privacy and anonymity of participants involved**

The participants were informed that the answers provided would be treated as strictly confidential and that their names and personal information would not be available to the researcher. Although the participants had to provide their student numbers, the participants were assured that their student numbers would only be used for research purposes by comparing their responses in the first questionnaire with their responses in the second questionnaire. The participants were further assured that their student numbers would not be used to gain access to their information or their academic record. To ensure that the participants understood, the researcher, prior to the participants' completing the questionnaire, also verbally assured the participants of their anonymity and that their answers would only be used for research purposes.

### **3.7.3 Informed consent and voluntary participation**

The participants received the questionnaire with a covering letter explaining the informed consent they would be giving (see Appendix A, p.98 and Appendix B, p.104). The participants were clearly informed that by completing the questionnaire they would be consenting to take part in this study on a voluntary basis. The participants who completed the questionnaire did it on a voluntary basis and no incentives were provided to encourage them to complete the questionnaire.



### **3.7.4 Confidentiality of data obtained from the participants**

Prior to the participants' completing the questionnaire, they were verbally informed that the results obtained from their responses would be used in conjunction with all the responses obtained and that their response would not be linked to them individually. The researcher further guaranteed that the results would be used for academic purposes only and that they might be published in an academic research journal after completion of the study.

## **3.8 CONCLUSION**

This chapter explained the research method and sampling plan followed. The chapter further discussed the overall research design, the sample selection, the data collection methods as well as the techniques used in analysing the data. The chapter also focused on the process followed to ensure that the research objectives were met and to test the hypotheses outlined in Chapter 1. Lastly, the chapter concluded with an account of the quality and rigour that apply to this study as well as the research ethics.

The next chapter discusses the results and findings of the data obtained during the survey process. Detailed analysis was done to provide a detailed explanation of the findings.

## CHAPTER 4

### ANALYSIS OF DATA

#### 4.1 INTRODUCTION

The previous chapter, Chapter 3, discussed the research design and methodology that applied to the study. Chapter 3 focussed on the sampling method, the questionnaire design and the method used to collect the relevant data. Chapter 3 concluded with a discussion of the research ethics and the validity of the current study.

The current study considered three main issues: firstly, students' perception of what they believe mobile learning to be, secondly Taxation students' willingness to engage with a mobile learning environment. Lastly, whether there was a change in acceptance towards engaging with a mobile learning environment as a result of students' becoming more familiar with their specific learning environment. The study also aimed to explore whether there is a difference in acceptance towards engaging with a mobile learning environment between male and female students.

The research design and methodology discussed in Chapter 3 were applied to gather the relevant data needed in order to draw conclusions based on the research objectives and to test the hypotheses. The analysis of the results and the testing of the hypotheses is discussed in this chapter. Programs such as SAS, IBM SPSS Statistics and Microsoft Excel were used to analyse the data in order to provide proper and accurate conclusions.

Demographic data were also captured and analysed in order to place the interpretation of the results in context. The study used the language indicator (Afrikaans or English) as the primary variable in analysing the demographic profile of the participants.

During the first round, 400 questionnaires were completed. From these 400 questionnaires the researcher was able to analyse the results to evaluate students' acceptance towards and their willingness to engage with a mobile learning environment. During the second round 267 students participated but only 189 questionnaires were analysed, namely the questionnaires from students who participated in both rounds. The 78 responses that were

not analysed can be used for future research. The researcher was able to analyse the results of the 189 questionnaires to determine whether there had been a change in students' willingness to engage with a mobile learning environment.

This chapter focuses on the results of the qualitative data gathered from the completed questionnaires.

## 4.2 DEMOGRAPHIC PROFILE OF RESPONDENT GROUP

The demographic profile of the respondent group who participated was only captured from Questionnaire (i) (see Questionnaire (i) in Appendix A, p.98). The demographic profile of the respondent group is illustrated in Table 5, 6 and 7.

Of the 400 questionnaires completed during the first round, only 394 could be used to determine the demographic profile of the respondent group, since six respondents failed to indicate the language in which they were taking the Taxation module. Since the students are all between the ages of 20 and 25 (third-year and fourth-year students), the students' age was not one of the demographic variables and is not illustrated in the findings.

**Table 5: Demographic profile of respondents: Gender and language**

Gender	Afr <sup>a</sup>	Eng <sup>a</sup>	Total
<b>Male</b>	64	97	161
% <sup>b</sup>	47.4%	37.5%	40.9%
<b>Female</b>	71	162	233
% <sup>b</sup>	52.6%	62.5%	59.1%
<b>Total</b>	135	259	394
% <sup>b</sup>	100%	100%	100%

a Afr = Afrikaans; Eng = English

b % = Percentage of the answers out of the total responses. Where applicable, rounded to one decimal place.

The majority of the respondent group (59.1%) are females; 40.9% are males. The Afrikaans group has slightly more females (52.6%) than males, and the English group also comprises more females (59.1%) than males (40.9%). The majority of the students are

white (55.7%), while 33.3% being black. One black and one coloured student were taking the Taxation module in Afrikaans.

**Table 6: Demographic profile of respondents: Language and race**

Race							
Language	Black <i>n</i>	Coloured <i>n</i>	Indian <i>n</i>	White <i>n</i>	Other <i>n</i>	No resp <sup>b</sup> <i>n</i>	Total <i>n</i>
<b>Afrikaans</b>	1	1	-	132	-	1	135
% <sup>a</sup>	0.7%	0.7%	-	98.5%	-	-	100%
<b>English</b>	130	5	34	87	3	-	259
% <sup>b</sup>	50.2%	1.9%	13.1%	33.6%	1.2%	-	100%
<b>Total</b>	131	6	34	219	3	1	394
% <sup>a</sup>	33.3%	1.5%	8.7%	55.7%	0.8%	-	100%

- a % = Percentage of the answers out of the total responses. Where applicable, rounded to one decimal place.  
 b No resp = No response (Question not answered)

**Table 7: Demographic profile of respondents: How students' studies are financed**

Financing of studies							
Language	Parents <i>n</i>	Bursary <i>n</i>	Loan <i>n</i>	Self <i>n</i>	Other <i>n</i>	Comb <sup>b</sup> <i>n</i>	Total <i>n</i>
<b>Afrikaans</b>	79	10	11	4	3	28	135
% <sup>a</sup>	58.5%	7.4%	8.1%	3.0%	2.2%	20.7%	100%
<b>English</b>	123	72	19	1	4	40	259
% <sup>a</sup>	47.5%	27.8%	7.3%	0.4%	4.5%	15.4%	100%
<b>Total</b>	202	82	30	5	7	68	394
% <sup>a</sup>	51.3%	20.8%	7.6%	1.3%	1.7%	17.3%	100%
<b>Gender</b>							
<b>Male</b>	84	36	10	3	4	26	163
% <sup>a</sup>	51.5%	22.1%	6.1%	1.8%	2.5%	16.0%	100%
<b>Female</b>	119	46	21	0	5	45	236
% <sup>a</sup>	50.4%	19.5%	8.9%	0%	2.1%	19.1%	100%
<b>Total</b>	203	82	31	3	9	71	399
% <sup>a</sup>	50.9%	20.5%	7.8%	0.7%	2.3%	17.8%	100%

- a % = Percentage of the answers out of the total responses. Where applicable, rounded to one decimal place.  
 b Comb = Combination of financing.

Only five students (1.3%) pay for their own studies; the majority (51.3%) of the students indicated that their parents finance their tertiary education. The majority (58.5%) of the Afrikaans group indicated that the primary source of their study finance was their parents while 8.1% were using study loans to finance their studies. Interestingly, parents were still reported to be the primary source of funding for the English group (47.5%), however, they have greater access to bursary schemes (27.8%) compared to the Afrikaans group, in which only 7.4% hold a bursary. It is clear from Table 7 that there is an even distribution between males and females and the way their studies are financed. No female was paying for her own studies.

### **4.3 FINDINGS FROM THE FIRST QUESTIONNAIRE (QUESTIONNAIRE (i))**

The results of Questionnaire (i) are discussed on the basis of the research objectives and the tests of the hypotheses outlined in Chapter 1.

As previously explained, this is a longitudinal study where the same group of participants were surveyed over two different academic years. The group of participants were first surveyed in their third-year undergraduate Commerce studies on 2 November 2012 and then again on 31 July 2013 during their fourth-year postgraduate Commerce studies.

Of the questionnaires handed out on 2 November 2012, 400 completed questionnaires (Questionnaire (i)) were received and analysed. The analysis and discussion of the relevant quantitative data captured were done using cross-tabulations of the different variables. In all the cross-tabulations done the data were thoroughly studied for any significant patterns. The study also aimed to explore the correlation between male and female students regarding their views on mobile learning and their interest in engaging with a mobile learning environment. In order to explore the correlation between two variables (males and females), the Chi-square test for independence was used (Pallant, 2011:217). The Chi-square test for independence is discussed in Section 3.5.

Previous research (Wang, Wu & Wang, 2009) has found that although male users expressed greater acceptance of mobile learning because it offers performance, an element of fun and self-management of learning, the researchers concluded that no

significant gender differences exist. This study aims to explore whether there is a gender difference regarding the acceptance of a mobile learning environment among South African university students.

By applying the Chi-square test for independence to test whether there is a gender difference regarding the acceptance of a mobile learning environment, the following hypothesis was tested:

- There is a difference in level of acceptance towards engaging with a mobile learning environment between males and females.

#### **4.3.1 Students' views on what they believe mobile learning to be**

Before the students acceptance of mobile learning can be analysed and tested, students' views of what they believe mobile learning to be should be investigated. During the survey process the students were presented with a definition of mobile learning in Section B of Questionnaire (i) which was formulated as follows: *Mobile learning can be defined as any sort of learning that happens when the learner is not at a fixed, predetermined location, or learning that happens when the learner takes advantage of the learning opportunities offered by mobile learning* (O'Mally et al., 2003:6). The students were then requested, on the basis of the definition provided, to indicate their views on what they believe mobile learning to be. Five statements (Questions 8–12) were provided, illustrating an activity that involved the use of a mobile device. The students had to indicate whether they believed that the activity would be an example of mobile learning or not by choosing *Yes*, *No* or *Not sure*. The results are illustrated in Table 8.

This section in Questionnaire (i) addressed the following research objective:

- To evaluate students' perceptions of what they believe "mobile learning" to be.

It is clear from the finding that a significant majority of the students believe that the activity listed in Questions 8 (86.8%), 9 (84.9%) and 11 (87.9%) are a form of mobile learning. The majority of the students indicated that using a mobile device to record observations (63.8%) and taking a picture of lecture notes (60.6%) are forms of mobile learning. However, the figure was not more than 80% as in the case of the other activities. It is

interesting to note that 30.2% of the students indicated that taking a picture of lecture notes was not a form of mobile learning and 9.1% were not sure. This indicates that there is a big perception gap as to whether students believe taking a picture of lecture notes represents a form of mobile learning.

**Table 8: Students' view on what they believe mobile learning to be**

Gender		Yes	No	Not sure	Total
<b>Question 8: Using a mobile device that is connected wirelessly to the internet while outside of class in the process of completing a research paper assignment (Formulated for Croop's, 2008 study)</b>					
Male	%	84.6%	9.9%	5.5%	100%
Female	%	88.4%	5.6%	6.0%	100%
Total	%	86.8%	7.4%	5.8%	100%
<b>Question 9: Using a web-enabled cell phone to read postings by other students and to post your own contribution to a discussion board that is a required activity of a class you are taking (Formulated for Croop's, 2008 study)</b>					
Male	%	77.8%	17.3%	2.0%	100%
Female	%	89.7%	7.7%	2.6%	100%
Total	%	84.9%	11.6%	3.5%	100%
<b>Question 10: Using a mobile device to record observations (Formulated for Croop's, 2008 study)</b>					
Male	%	66.1%	25.9%	8.0%	100%
Female	%	62.2%	22.3%	15.5%	100%
Total	%	63.8%	23.8%	12.4%	100%
<b>Question 11: Loading textbooks in electronic format to be accessed on a mobile device and read by a student on his/her way to campus on a bus or on the train</b>					
Male	%	88.8%	10.0%	1.2%	100%
Female	%	87.1%	9.0%	3.9%	100%
Total	%	87.8%	9.4%	2.8%	100%
<b>Question 12: Taking a picture of lecture notes that are not made available to students in another form.</b>					
Male	%	62.4%	29.0%	8.6%	100%
Female	%	59.4%	31.2%	9.4%	100%
Total	%	60.6%	30.3%	9.1%	100%

From the definition of mobile learning provided to the students and the definition adopted by the study (*Mobile learning refers to mobile or handheld devices used in a learning environment*) it is clear that the emphasis in mobile learning is placed on the use of a mobile device and students' willingness to use mobile devices as an educational tool wherever they are. All the activities listed in Questions 8–12 involve a mobile or handheld

device which is used for an educational purpose of some kind. Therefore, it can be concluded that the five activities all represent a form of mobile learning as defined in this study.

Croop (2008:97) found, however, that 91% of the respondents believe that using a wireless laptop is a form of mobile learning, compared to 86.8% in the current study who believe using a mobile device with wireless connection is a form of mobile learning. It appears from the current study that 84.9% of the students believe that reading postings on a web-enabled cell phone and posting contributions on a discussion board are a form of mobile learning. In Croop's (2008:98) study only 71% indicated that they believe this activity to be a form of mobile learning. In the 638 completed surveys in Croop's (2008:98) study, 71% of respondents indicated that they believe recording observations using a mobile device is mobile learning, compared to only 63.9% in the current study who believe this is a form of mobile learning.

From the results of the Chi-square test (refer to Table 9) it is clear that only Question 9 showed a significant difference (a value of 0.005 is smaller than the alpha value of 0.05) between the responses provided by male and female students. Significantly more female students (89.7%) believe that using a web-enabled cell phone to read postings by other students and posting your own contribution to a discussion board that is a required activity for a class they are taking are forms of mobile learning.

**Table 9: Correlation between male and female students regarding what they believe mobile learning to be**

Statement	Test statistics	2-tailed P value	Conclusion
Question 8	2.56	0.278	$0.278 > 0.05 =$ Not significant
Question 9	10.72	0.005	$0.005 < 0.05 =$ Significant
Question 10	2.99	0.083	$0.083 > 0.05 =$ Not significant
Question 11	2.46	0.292	$0.292 > 0.05 =$ Not significant
Question 12	0.348	0.840	$0.840 > 0.05 =$ Not significant

The values for Questions 8, 10, 11 and 12 are larger than the alpha value of 0.05. This means that there is no significant gender difference. Croop (2008:96-99) did not apply any correlation tests to determine the correlation between different variables for the three activities (Questions 8–10).



### 4.3.2 Mobile electronic devices students own and use

The type of mobile device students own is illustrated in Table 10. Where language was used as the primary variable, only 394 responses were analysed since six students failed to indicate the language through which they were attending Taxation 300 lectures. Where gender was used as the primary variable, 399 responses were analysed since one student failed to indicate his/her gender.

**Table 10: Mobile electronic devices students own and use**

Language	iPad <sup>c</sup> <i>n</i>	iPhon e <sup>c</sup> <i>n</i>	SST <sup>d</sup> <i>n</i>	BB <sup>e</sup> <i>n</i>	Other <i>n</i>	None <i>n</i>	No resp b <i>n</i>	Comb <sup>f</sup> <i>n</i>	Total <i>n</i>
<b>Afrikaans</b>	14	13	5	82	51	1	2	(33)	135
% <sup>a</sup>	10.5%	9.8%	3.8%	61.7%	38.3%	0.8%	-	(24.8%)	100%
<b>English</b>	33	28	11	161	103	1	1	(79)	259
% <sup>a</sup>	12.8%	10.9%	4.3%	62.4%	39.9%	0.4%	-	30.6%	100%
<b>Total</b>	47	41	16	243	154	2	3	(112)	394
% <sup>a</sup>	12.0%	10.5%	4.1%	62.1%	39.4%	0.5%	-	(28.6%)	100%
<b>Gender</b>	<i>n</i>	<i>n</i>	<i>n</i>	<i>n</i>	<i>n</i>	<i>n</i>	<i>n</i>		<i>n</i>
<b>Male</b>	23	23	9	85	70	0	1	(48)	163
% <sup>a</sup>	14.2%	14.2%	5.6%	52.5%	43.2%	0%	-	(29.6%)	100%
<b>Female</b>	24	18	7	159	84	2	2	(60)	236
% <sup>a</sup>	10.3%	7.7%	3.0%	67.9%	35.9%	0.9%	-	(25.6%)	100%
<b>Total</b>	47	41	16	244	154	2	3	(108)	399
% <sup>a</sup>	11.9%	10.4%	4.0%	61.6%	38.9%	0.5%	-	(27.3%)	100%

a % = Percentage of the answers out of the total responses. Where applicable, rounded to one decimal place.

b No Resp = No response (Question not answered)

c Apple iPad; Apple iPhone

d Samsung tablet

e Blackberry cell phone

f Comb = Combination of devices

One Afrikaans student and one English student (0.5%), both female (0.9%), indicated that they do not own any mobile device whereas all the males included in the sample own some sort of mobile device or a combination of devices (29.6%). A significant majority of the students indicated that they own a Blackberry cell phone, especially females, where a

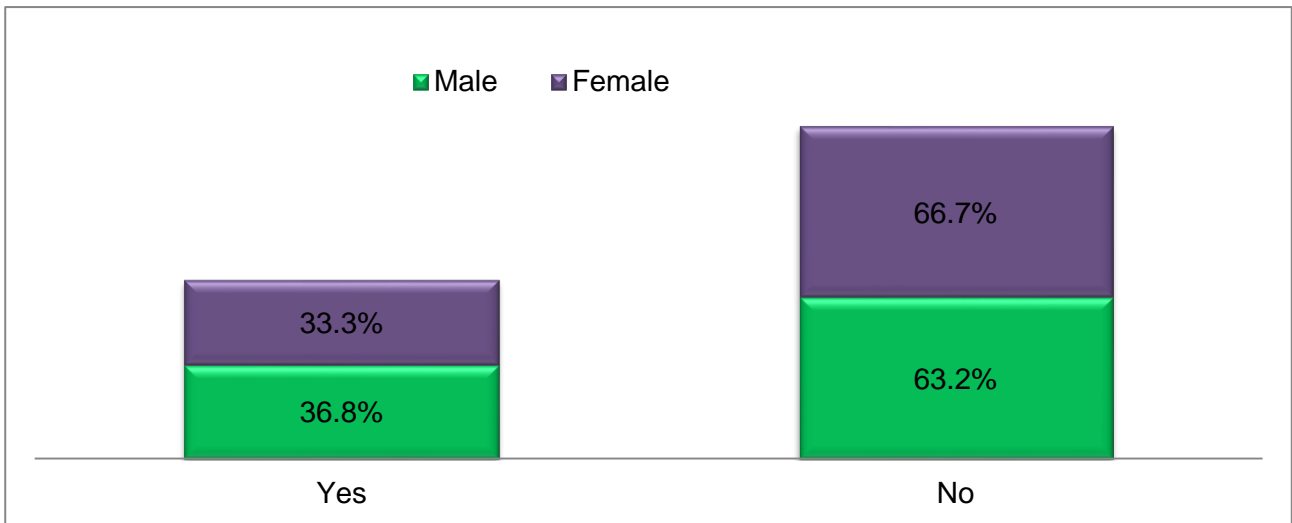
majority average of 67.9% owned a Blackberry cell phone. Slightly more English students (12.8%) own an Apple iPad compared to only 10.5% of Afrikaans students who own one. An average of 28.6% (language-variable) and 27.3% (gender-variable) own more than one mobile device, namely a combination of the provided variables.

The researcher did not apply the Chi-square test in order to explore the correlation between males and females and the type of mobile device they own and use. The reason for this is that it is not the researcher's intention to establish what type of mobile device is used but rather whether the students are willing to use a mobile device for educational purposes.

#### **4.3.3 Third-year Taxation students who are already using a mobile electronic device for educational purposes**

Question 13 of Questionnaire (i) asked the students to indicate whether they use an Apple iPad, Apple iPhone or any tablet (if they own one) for educational purposes (during their taxation lectures). Only 212 students answered the question. It is assumed that the students who did not answer the question do not own an Apple iPad, Apple iPhone or tablet and possibly just own a cell phone, as indicated in Table 10. The findings of Question 13 are illustrated in a frequency distribution (Figure 1) as this is the simplest way of illustrating data when there is only one variable (Saunders *et al.*, 2007:423). Of the students who responded, the majority (65.1%) indicated that they do not use their Apple iPad, Apple iPhone or tablet for educational purposes during their Taxation lectures.

**Figure 1: Percentage of third-year Taxation students using mobile electronic devices for educational purposes**



The Chi-square test is used to explore the correlation between males and females and whether they use an Apple iPad, iPhone or tablet for educational purposes, as illustrated in Table 11. The findings indicated that there is no significant difference between males and females already making use of mobile devices for educational purposes. This statement is supported by the fact that the Chi-square value of 0.594 is larger than the alpha value.

**Table 11: Correlation between third-year male and female students who use their mobile device for educational purposes**

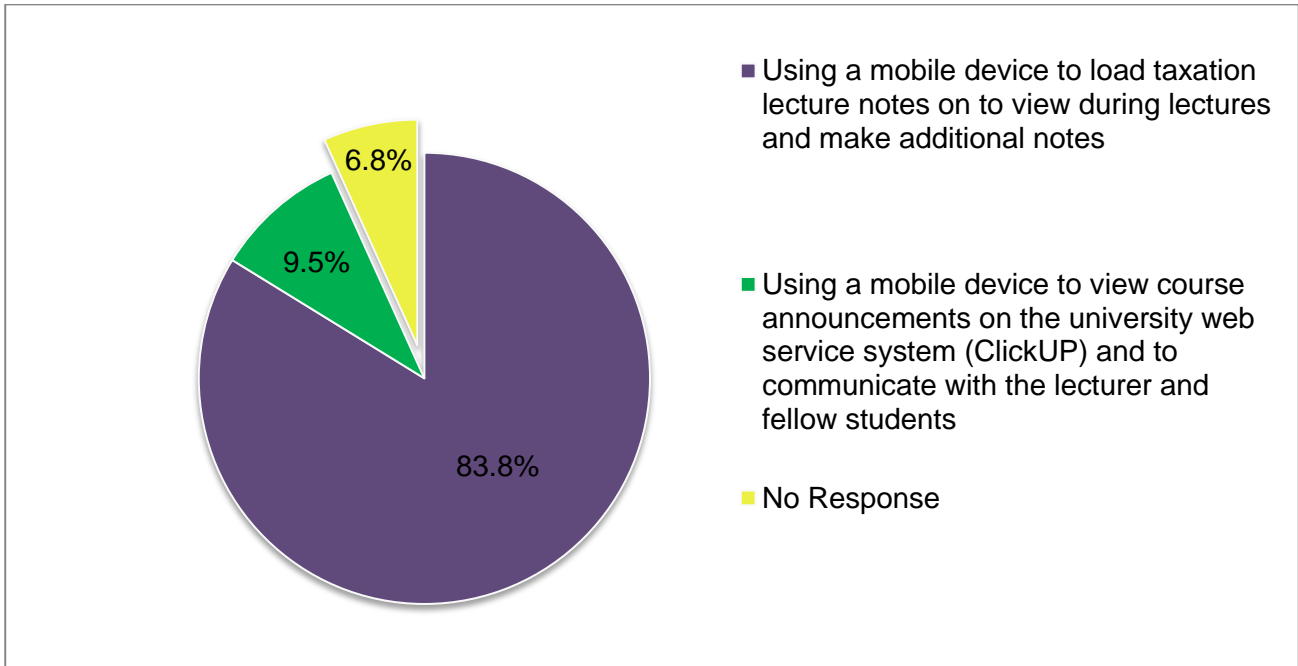
Question 13	Test statistics	2-tailed P value	Conclusion
	0.284	0.594	$0.594 > 0.05 =$ Not significant

Question 13.1 in Questionnaire (i) was an open-ended question where students were asked to record how they are using their Apple iPad, Apple iPhone or tablet in the Taxation module. The responses were analysed and grouped together into the following two themes:

- The use of a mobile device to load taxation lecture notes on, to view during lectures and make additional notes
- The use of a mobile device to view course announcements on the university web service system (ClickUP) and to communicate with the lecturer and fellow students

From the themes the researcher was able to determine the most common uses to which students apply their Apple iPad, Apple iPhone or tablet during their Taxation lectures. The data are illustrated in Figure 2.

**Figure 2: How do third-year students apply their mobile device during their Taxation lectures?**



Of the 74 students who use their mobile device for educational purposes, a significant majority of 83.8% use their mobile device to load the lecture notes on in order to view them in class and make additional notes.

#### **4.3.4 Third-year students' acceptance towards and willingness to engage with a mobile learning environment**

The aim of the current study, however, was not to determine whether the students already make use of a mobile device as an educational tool but to ascertain whether they are interested in the option of carrying out some of their class learning activities through mobile learning using an Apple iPad, iPhone, tablet or e-reader with wireless internet connection.

Four questions in Questionnaire (i) requested the students to express their interest in mobile learning and the acceptance of a mobile learning environment (see Questions 14,

15, 16 and 17 of Questionnaire (i). These questions address the following research objective:

- To determine whether students are willing to engage with a mobile learning environment.

These questions also test the following hypotheses:

- Students, when given the opportunity, will usually respond more positively towards engaging with a mobile learning environment.
- There is a difference in level of acceptance towards engaging with a mobile learning environment between males and females.

The four questions relating to a mobile learning environment and the data captured are discussed below.

*Students' interest in carrying out some class learning activities though mobile learning*

Question 14 in Questionnaire (i) asked the students to indicate whether they were interested in carrying out some class learning activities through mobile learning using an Apple iPad, Apple iPhone or tablet with wireless internet connection. Table 12 illustrates the results of Question 14. The majority (67.5%) of the students indicated that they were interested in engaging with a mobile learning environment, with males indicating a higher interest (75.2%) than females (62.2%). This corresponds with more female students (22.2%) expressing their lack of interest in engaging with a mobile learning environment. However, 15.7% of female students are still undecided on whether they would like to carry out some class learning activities though mobile learning using an Apple iPad, Apple iPhone or tablet with wireless internet connection.

**Table 12: Students' interest in carrying out some class learning activities though mobile learning**

<b>Gender</b>	<b>Yes</b>	<b>No</b>	<b>Not sure</b>
Males	75.2%	19.9%	5.0%
Females	62.2%	22.2%	15.7%

This question is similar to that of Croop's (2008:92) study. Croop (2008:92), however, found that 80% of the students were interested in the option of carrying out some learning activities with mobile technologies. It is interesting to note that even with the new

technologies that exist only 67.5% of the students in the current study were interested in engaging with a mobile learning environment. The current study still indicates that the majority of South African Taxation students were interested in engaging with a mobile learning environment.

The fact that the majority of students are willing to engage with a mobile learning environment may spring from students' enjoyment of learning when classes are presented in an enjoyable, interesting way using mobile technologies (Baya & Daher, 2009:85; Croop, 2008:107; Liaw *et al.*, 2010:453; Wang *et al.*, 2009:693). Students perceive mobile learning to be fun and not boring since the learning approach using mobile technologies appeals to them and is a part of their daily life as a 21st century student (Croop, 2008:107; Liebenberg in Rademeyer, 2012:8).

*Students' interest in purchasing electronic version textbooks accessed on a mobile device rather than hardcopy textbooks*

In their third year (Taxation 300) the students are required to purchase the prescribed textbook in hardcopy. Question 15 in Questionnaire (i) asked the students to indicate whether they would rather purchase the textbooks in electronic format to be loaded on a mobile device (e.g. an Apple iPad) or whether they would still prefer to study from a hardcopy textbook. A frequency distribution in Table 13 is used to illustrate the findings of Question 15.

In this study 46.1% of the students indicated that they would use the electronic textbook in the next academic year, 37.7% would mostly use the hardcopy textbook and 46.1% would use a combination of the two. Slightly more males (16%) are interested in only purchasing the electronic version of the textbooks compared to females (15.5%). It is interesting to note that none of the females was undecided whereas 1.2% of males were unsure of their decision.

**Table 13: Third-year students' willingness to purchase hardcopy or electronic format textbooks to study from**

<b>Gender</b>	<b>Electronic</b>	<b>Hardcopy</b>	<b>Both</b>	<b>Not sure</b>
Males	16.0%	37.0%	45.7%	1.2%
Females	15.5%	38.2%	46.4%	0.0%

Students' interest in using an electronic version of the Act accessed on a mobile device versus hardcopy textbooks in open-book assessments

In their third year (Taxation 300) the students are not permitted to take textbooks in any form into an assessment. However, during students' fourth year of studies they are allowed to take the *2012/13 SAICA Legislation Handbook Volume 2* into an assessment. In the first questionnaire (while the students were still in their third year) Question 16 asked whether they would prefer to take the Act in electronic format into assessments or would rather still take the hardcopy textbook into assessments during their fourth-year postgraduate Commerce studies. Table 14 illustrates the findings.

**Table 14: Third-year students' willingness to use either hardcopy or electronic format textbooks during open-book assessments**

Gender	Electronic	Hardcopy	Both	Not sure
Males	29.4%	39.3%	27.0%	4.3%
Females	30.3%	41.0%	26.1%	2.6%

It is clear that 40.2% of the students indicated that they would use the electronic textbook during open-book assessments in the next academic year; 40.2% said they would mostly use the hardcopy textbook and 26.6% would use a combination of the two. It is interesting to note that slightly more females (30.3%) would prefer to use only the electronic version of the textbook compared to males (29.4%). However, 3.5% of the students were still unsure of what they would use in an open-book assessment.

Students' opinion of building the cost of an Apple iPad into their tuition fees

Question 17 requested the students to indicate whether they feel that the University of Pretoria should consider building the cost of an Apple iPad into the tuition fees for their degree. Table 15 illustrates the findings.

**Table 15: Third-year students' opinion of building the cost of an Apple iPad into their tuition fees**

Gender	Yes	No	Not sure
Males	55.2%	33.7%	11.0%
Females	63.2%	24.8%	12.0%

Since Rhodes University and the University of South Africa (UNISA) are considering building the cost of an Apple iPad into the tuition fees for students (Stiglingh, 2012), the

University of Pretoria should also consider this option. However, the opinion of students on whether they believe their tuition fees should include the cost of a mobile device should first be investigated before the University can make such a decision.

The majority (59.6%) of the students strongly feel that the University should definitely consider building the cost of an Apple iPad into the tuition fees for their degree. Interestingly, although more females indicated a lack of interest in engaging with mobile learning (Table 12), more females (63.2%) than males (55.2%) indicated that the University should consider building the cost of a mobile device into students' tuition fees. Although this was a closed-ended question, one student wrote the words "*definitely, without a doubt*" on the questionnaire to express how strongly he agrees with this statement.

Comparing the results of Question 17 with the gender variable, it is interesting to note that of the 33.7% male students who indicated that the University should not consider building the cost of an Apple iPad into the tuition fees, the parents of the majority (56.4%) finance their studies and 5.5% of them finance their own studies. A possible reason for this negative reaction might be that the students believe that their tuition fees will increase significantly when the University builds the cost of an Apple iPad into the tuition fees, making it impossible for their parents or themselves to finance their studies. Of the 24.8% of female students who expressed a negative attitude towards this question, the parents of the majority (58.6%) also finance their studies. Out of the students who indicated that the University should definitely consider this option, a large number rely on bursaries or study loans (20.8%), compared to students who indicated "No" (4.8%).

#### *Gender correlation of Questions 14, 15, 16 and 17 of Questionnaire (i)*

Table 16 illustrates the correlation between the interest of males and that of females in engaging with a mobile learning environment.

According to the Chi-square test for Question 14 (0.002 is smaller than the alpha value of 0.05), there is a significant difference between the interest of males and the interest of females in using a mobile device to carry out some class learning activities. Significantly



more males are interested in using mobile technologies for educational purposes than are females.

**Table 16: Gender correlation of third year students' interest in engaging with a mobile learning environment**

	<b>Test statistics</b>	<b>2-tailed P value</b>	<b>Conclusion</b>
<b>Question 14</b>	12.205	0.002	$0.002 < 0.05$ =Significant
<b>Question 15</b>	2.942	0.401	$0.401 > 0.05$ = Not significant
<b>Question 16</b>	1.009	0.799	$0.799 > 0.05$ = Not significant
<b>Question 17</b>	3.812	0.149	$0.149 > 0.05$ = Not significant

The Chi-square tests done for Questions 15, 16 and 17 each calculated a value exceeding the alpha value of 0.05. It is therefore concluded from students' opinions gathered from Questions 15, 16 and 17 that there are no significant gender differences. The study by Wang, Wu & Wang (2009:111) determined that no gender differences exist when it comes to interest in engaging with a mobile learning environment. However, men expressed slightly more interest in using e-books since this allows them to be self-sufficient (Rowlands *et al.*, 2007:509).

#### 4.3.5 Summary

From the findings of Questionnaire (i) it is clear that the majority of third-year undergraduate Commerce Taxation students are interested in engaging with a mobile learning environment, with males indicating slightly more interest than females. From the Chi-square test values it appears that there is no significant difference between the interest of males and that of females to use either electronic or hardcopy textbooks. The interest levels among females and males appeared consistent.

In the next section (Section 4.4), a possible change in interest and acceptance is analysed and discussed after Questions 14, 15, 16, and 17 of Questionnaire (i) were repeated in the second questionnaire, approximately 7 months later (see Appendix B, p.104). As students become more familiar with their specific learning environment and with being able to write open-book assessments, they are expected to show a change in their willingness to

engage with a mobile learning environment. It is expected that the majority of the students will change from “*not interested*” to “*being interested*”.

#### **4.4 FINDINGS OF THE FOLLOW-UP QUESTIONNAIRE (QUESTIONNAIRE (ii))**

The respondent group were surveyed again during the next academic year when the students were in their fourth (postgraduate) year of Commerce studies. The results of the second questionnaire are compared with the results of the first questionnaire to determine whether the respondents had changed their views regarding acceptance towards and willingness to engage with a mobile learning environment. The second questionnaire was conducted in July 2013 after the students had become familiar with open-book assessments and carrying the two bulky prescribed textbooks around.

The findings of Questionnaire (ii) were analysed, with gender as the primary variable. During the second questionnaire session 267 students participated, 189 of whom had also completed the first questionnaire. The data analysed in this section will only illustrate the findings of the 189 students who participated in both rounds. This section will illustrate the findings of Questionnaire (ii) and compare them with the responses captured during the analysis of Questionnaire (i).

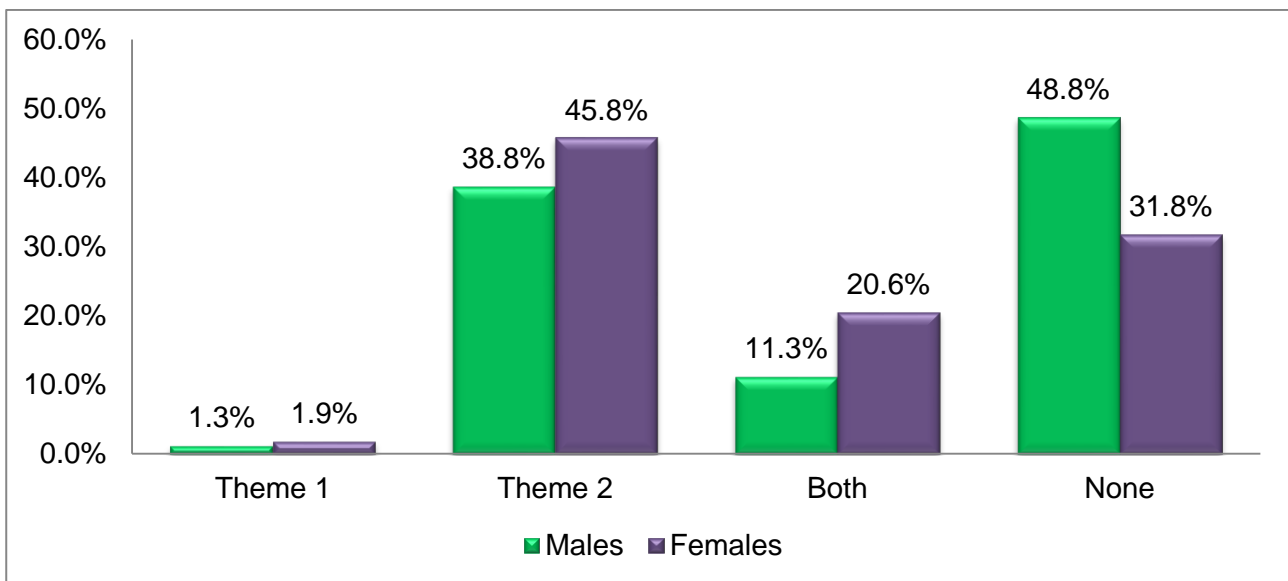
##### **4.4.1 Fourth-year Taxation students who use a mobile electronic device for educational purposes**

Question 2 of Questionnaire (ii) was formulated from Question 13 and the findings for Question 13.1 in Questionnaire (i). Students had to indicate whether they were using a mobile device during their fourth year Taxation lectures and then also indicate how they were using the device, based on the following two themes formulated from the findings of Questionnaire (i):

- Theme 1: Using a mobile device to load Taxation lecture notes on to view during lectures and make additional notes
- Theme 2: Using a mobile device to view course announcements on the university web service system (ClickUP) and to communicate with the lecturer and fellow students

The findings are illustrated in Figure 3. Most Taxation 700/760 students (42.3%) only use their mobile device to view announcement on the University web system, and 40.3% do not apply their mobile device for educational purposes in any way. It is interesting to note that during their third year of studies more students (83.8%) used their mobile device for loading the notes and viewing them during class (see Figure 2), whereas now in their fourth year only 18.2% used their mobile device to load notes for viewing during class. This sudden drop in usage (Theme 1) might be due to the fact that the Taxation 700/760 students mostly work directly from the legislation and currently the legislation is not available in electronic format. More females (68.2%) than males (51.3%) reported that they made use of their mobile device for either loading the notes or viewing announcements and communicating with peers and lecturers. .

**Figure 3: Percentage of the fourth-year Taxation students using mobile electronic devices for educational purposes**



The Chi-square test of independence indicates a value of 0.093 (refer to Table 17). The value is larger than the alpha value, indicating that no significant gender difference exists in the usage of mobile devices as educational tool.

**Table 17: Correlation between the fourth-year male and female students and the educational uses for which they apply their mobile device**

Question	Test statistics	2-tailed P value	Conclusion
Educational use of mobile device	6.413	0.093	0.093 > 0.05 =Not significant

#### **4.4.2 The possible change in acceptance towards and willingness to engage with a mobile learning environment**

In this section the following research objective is considered:

- To evaluate a possible change in acceptance towards and willingness to engage with a mobile learning environment over two different years of study.

This section also aims to test the following hypotheses:

- Students will show a positive change in acceptance towards and willingness to engage with a mobile learning environment as they become more familiar with their specific learning environment.

Since the respondents were surveyed twice a change in acceptance towards and willingness to engage with a mobile learning environment can be investigated. The first questionnaire was administered before the students were familiar with open-book assessments (pre-test). The second questionnaire was administered after the students had written a number of open-book assessments (post-test). The researcher was able to investigate a possible change in responses as the students became more familiar with open-book assessments and determine whether their attitude had changed in respect of acceptance towards mobile learning and the use of mobile devices in open-book assessments.

A Paired Sample t-test was used since the researcher was interested in analysing the changes in student responses that were first surveyed in November 2012 and then again in June 2013. Since the respondents were first surveyed before they were familiar with open-book assessments and then again after they had written a number of open-book assessments, the Paired Sample t-test was the most appropriate test to determine whether there had been a change in responses (Pallant, 2011:243). The Kappa Measure of Agreement (Kappa test) was also applied. The Paired Sample t-test and the Kappa test are discussed in detail in Section 3.5.

The Paired Sample t-test was carried out for the two different gender groups whereas the Kappa test was carried out for the entire group in general. The distribution results,

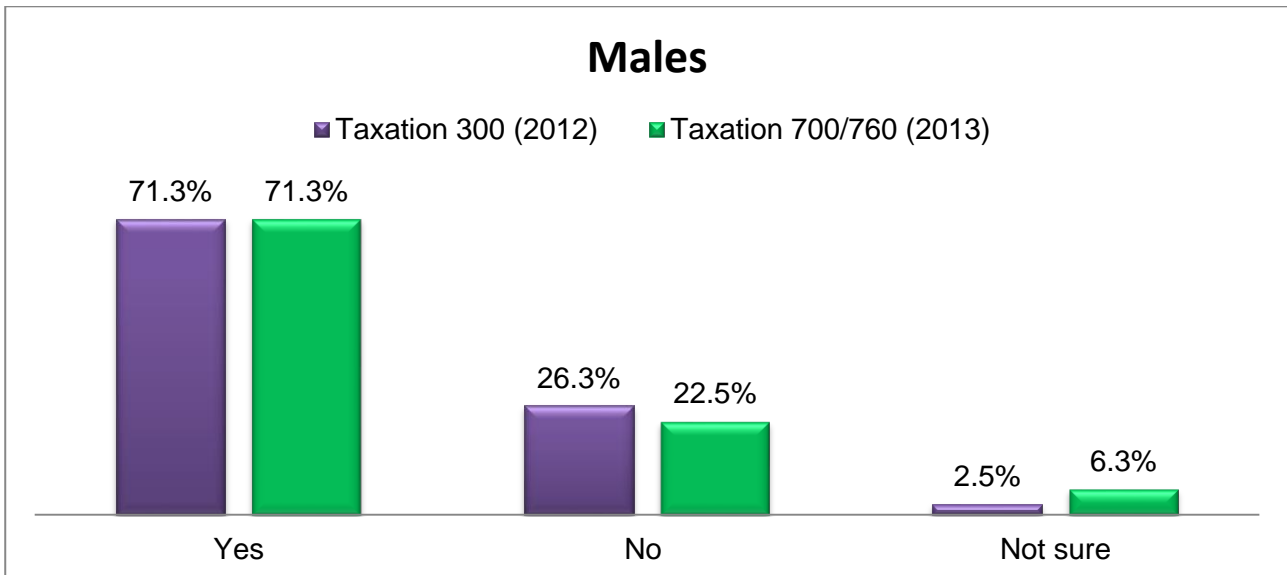
including the Paired Sample t-test and the Kappa test, of the 189 students, 81 of which were male and 108 female, who participated in both rounds are discussed in this section.

Fourth-year students' interest in carrying out some class learning activities through mobile learning compared to their response during their third year of studies

The second question in Questionnaire (ii) was similar to Question 14 in Questionnaire (i). Again, the students had to indicate their interest in carrying out some class learning activities through the use of a mobile device. The majority of the students (69.1%) indicated that they were still interested in engaging with learning activities with the aid of mobile devices with males (71.3%) expressing a slightly higher level of interest compared to females (68.2%).

Frequency distributions were again used to illustrate the differences in the opinions of male and female students and a comparison was then drawn with the responses captured during the first questionnaire. These differences are summarised in Figure 4 (males) and Figure 5 (females).

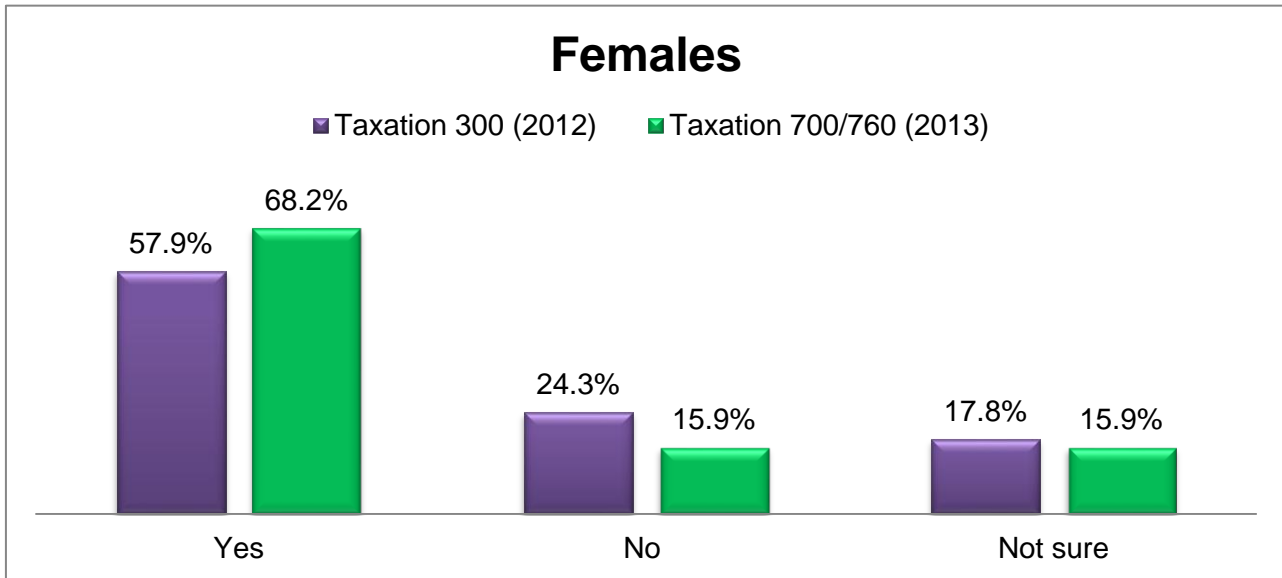
**Figure 4: Taxation 700/760 male students' interest in engaging with a mobile learning environment compared to their response in 2012**



From the frequency distribution it is clear that there was no significant change in the students' interest in engaging with a mobile learning environment compared with their responses as captured in the first questionnaire. There was a 10.3% positive increase in

female students' responses on engaging with a mobile learning environment whereas the male responses remained unchanged at 71.3%.

**Figure 5: Taxation 700/760 female students' interest in engaging with a mobile learning environment compared to their response in 2012**



From the data analysed, 53.5% indicated that they were still interested in carrying out some learning activities using a mobile device. The analysed data indicated a 16% positive change where students changed from a *No* or *Not Sure* in Questionnaire (i) to a *Yes* in Questionnaire (ii). However, a 10.2% negative change was captured where students changed from a *Yes* in Questionnaire (i) to a *No* or *Not Sure* in Questionnaire (ii), as Table 18 reflects.

**Table 18: The change in students' interest in engaging with mobile learning**

Indicator	
Still <i>YES</i>	53.5%
From <i>NO</i> or <i>NOT SURE</i> to <i>YES</i>	16%
Still <i>NO</i> or <i>NOT SURE</i>	20.3%
From <i>YES</i> to <i>NO</i> or <i>NOT SURE</i>	10.2%

A Paired Sample t-test was done to investigate the change in students' interest in engaging with a mobile learning environment. It is evident from Table 19 that the probability (p) values (sig. 2-tailed) of 0.581 and 0.160 for both male and female students respectively are larger than the alpha value of 0.05. It can therefore be concluded that there is no significant difference between the students' responses as reflected in the two

scores captured at two different time periods. The Eta-square statistic calculated for both male (0.0039) and female (0.0184) scores is smaller than 0.06. This indicates a small effect on the difference between responses from Questionnaire (i) and Questionnaire (ii).

**Table 19: Paired Sample t-test for Question 14 in Questionnaire (i) compared to Question 3 in Questionnaire (ii)**

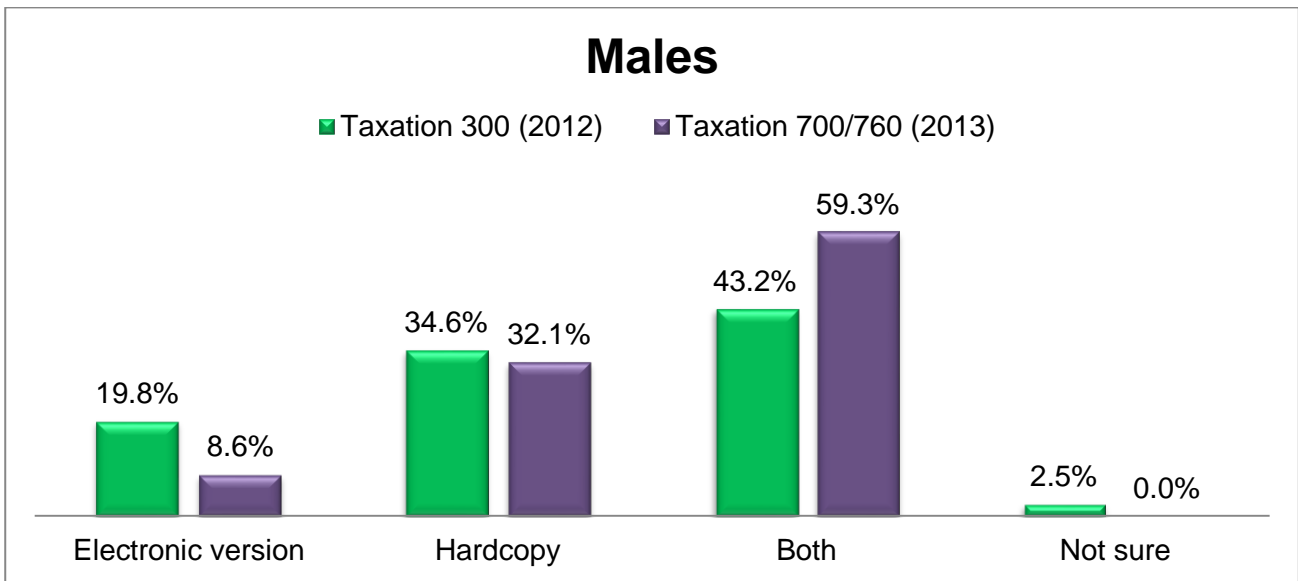
Gender	N (number of students)	Standard deviation	t value	df (Degrees of freedom)	Sig. (2- tailed)	Eta - square statistic
Male	80	0.6047	-0.555	79	0.581	0.0039
Female	107	0.8871	1.417	106	0.160	0.0184

The Kappa test value is 0.2904, which is smaller than 0.5, indicating a poor agreement between each student's individual responses as reflected in the two scores. This is supported by the cross-tabulation table, which indicates that 35.3% of the respondents changed their responses between Questionnaire (i) and Questionnaire (ii).

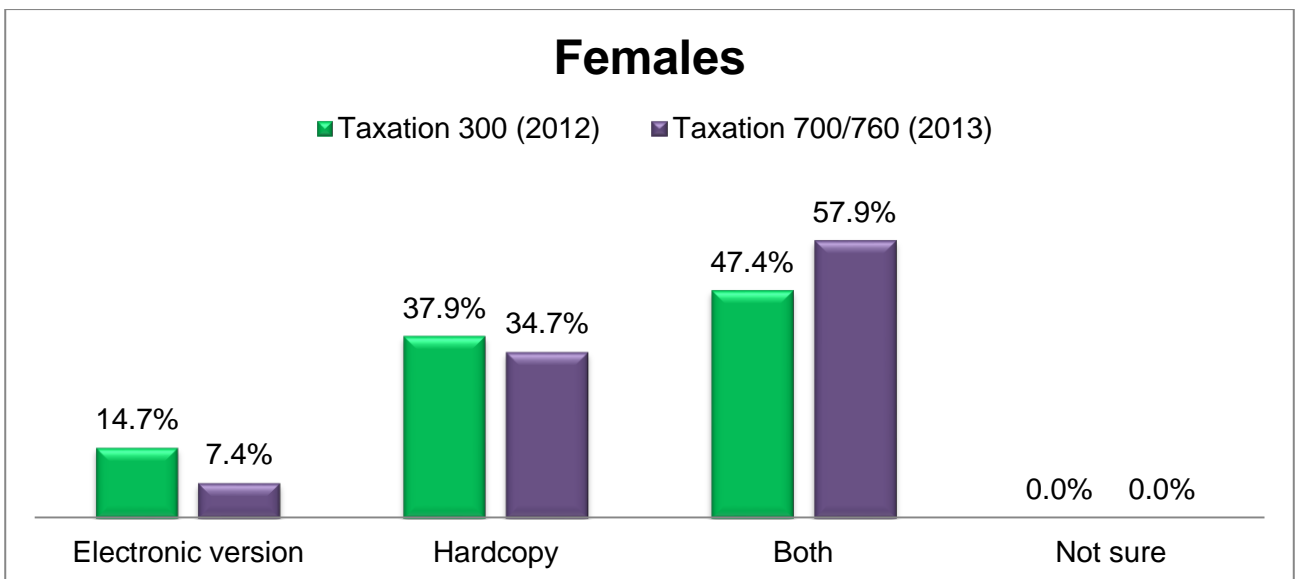
*Taxation 700/760 students' interest in purchasing electronic version textbooks accessed on a mobile device versus hardcopy textbooks, compared to their responses in 2012*

The results of the frequency distribution for Question 15 of Questionnaire (i) and Question 4 of Questionnaire (ii) are summarised in Figure 6 (males) and Figure 7 (females). The frequency distribution illustrates an almost 10% decrease in the number of students who said that they would only purchase the textbook in electronic format. There was, however, an increase (12.8%) in the number who would purchase the textbook in both hardcopy and electronic format.

**Figure 6: Taxation 700/760 male students' interest in purchasing the textbooks in electronic format versus hardcopy, compared to their response in 2012**



**Figure 7: Taxation 700/760 female students' interest in purchasing the textbooks in electronic format versus hardcopy, compared to their response in 2012**



From the above graphs it is clear that there were slight changes in the individual responses between 2012 and 2013 among the male respondents; however, the changes amount to less than 20%. According to the Paired Sample t-test (Table 20), the probability (p) value (sig. 2-tailed) of 0.071 for male students is larger than the alpha value of 0.05, indicating no significant difference between the male responses as reflected in the two scores. The probability (p) value (sig. 2-tailed) for the female students is 0.010, which is smaller than the alpha value of 0.05. It can therefore be concluded that there is a



significant difference between female students' responses as reflected in the two scores captured at two different time periods. The Eta-square statistic for the male (0.0401) students indicates a small effect, whereas the Eta-square statistic for female (0.0612) students indicates a moderate effect on the difference between responses from Questionnaire (i) compared to Questionnaire (ii).

**Table 20: Paired Sample t-test for Question 15 in Questionnaire (i) compared to Question 4 in Questionnaire (ii)**

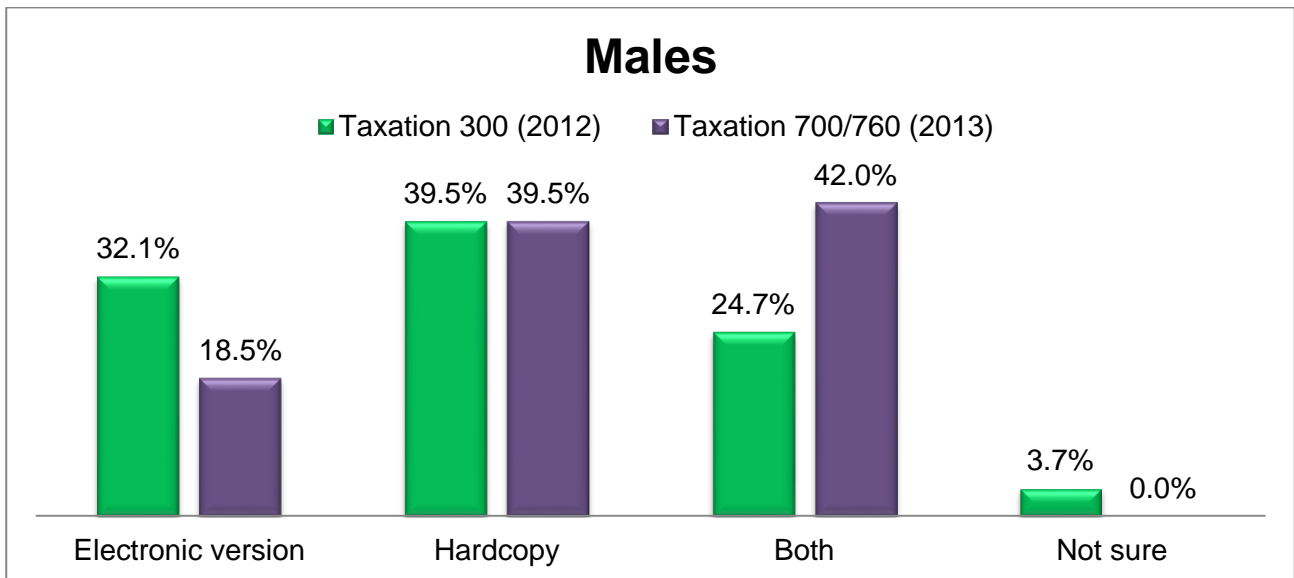
Gender	N (number of students)	Standard deviation	t value	df (Degrees of freedom)	Sig. (2- tailed)	Eta- square statistic
Male	81	1.0334	-1.828	80	0.071	0.0401
Female	107	0.8828	-2.628	106	0.010	0.0612

The Kappa test value for the entire group is 0.2349, which is smaller than 0.5, again indicating a poor agreement between each student's individual responses as reflected in the two scores. The cross-tabulation table indicates that only 53.7% of the students recorded the same response in Questionnaire (i) and Questionnaire (ii). However, 46.3% of the students expressed a change in opinion from their initial response in Questionnaire (i) compared to their response in Questionnaire (ii).

*Taxation 700/760 students' interest in using electronic version textbooks accessed on a mobile device versus hardcopy textbooks in open-book assessments, compared to their responses in 2012*

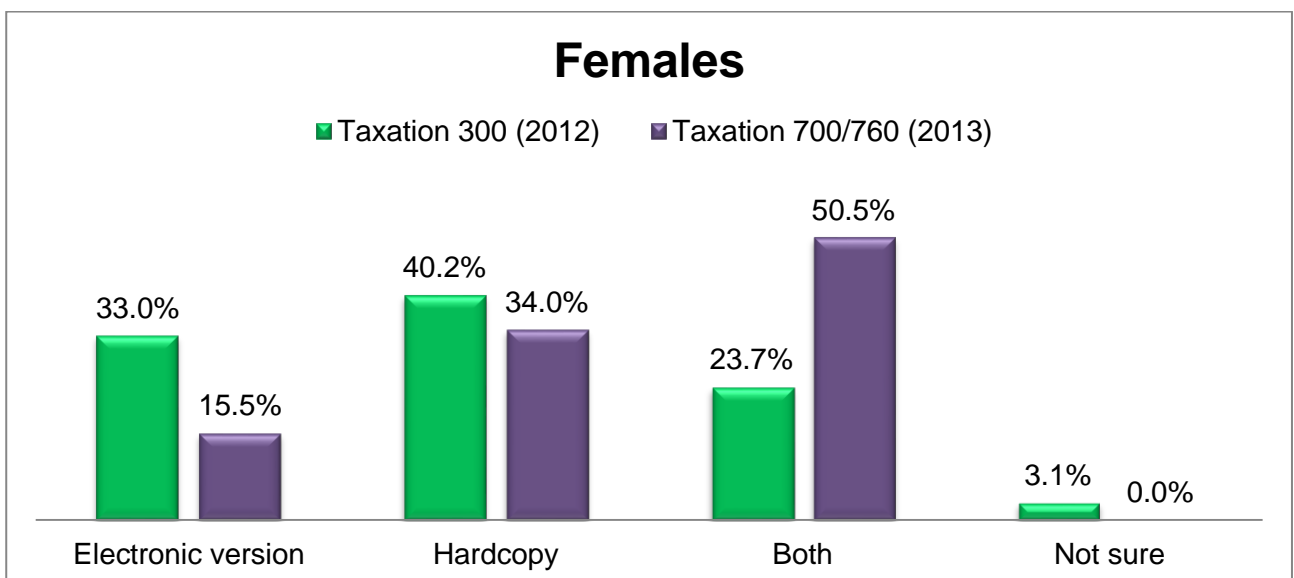
Frequency distributions are used to summarise students' responses as to whether they would still prefer to take the hardcopy textbook, the electronic version or both versions into an open-book assessment. The findings are illustrated in Figure 8 (males) and Figure 9 (females).

**Figure 8: Taxation 700/760 male students' interest in using the textbooks in electronic format or hardcopy in open-book assessments, compared to their response in 2012**



There was an overall decrease of 14.4% in student responses in favour of only making use of the electronic version of the textbook during an open-book assessment. An overall increase of 20.6% is captured in students' responses on taking both the electronic version and the hardcopy textbook into an open-book assessment.

**Figure 9: Taxation 700/760 female students' interest in using the textbooks in electronic format or hardcopy in open-book assessments, compared to their response in 2012**



The Paired Sample t-test is illustrated in Table 21. The probability (p) value (sig. 2-tailed) of 0.066 for male students is larger than the alpha value of 0.05. It is concluded that there

is no significant difference between the male responses reflected in the two scores. The probability (p) value (sig. 2-tailed) for the female students is 0,00, however; which is smaller than the alpha value of 0.05, indicating a significant difference between female students' responses as reflected by the two scores captured at two different time periods. The Eta-square statistic indicates a small effect for the male students whereas the Eta-square statistic for female students indicates a moderate effect on the difference between responses from Questionnaire (i) and Questionnaire (ii).

**Table 21: Paired Sample t-test for Question 16 in Questionnaire (i) compared to Question 5 in Questionnaire (ii)**

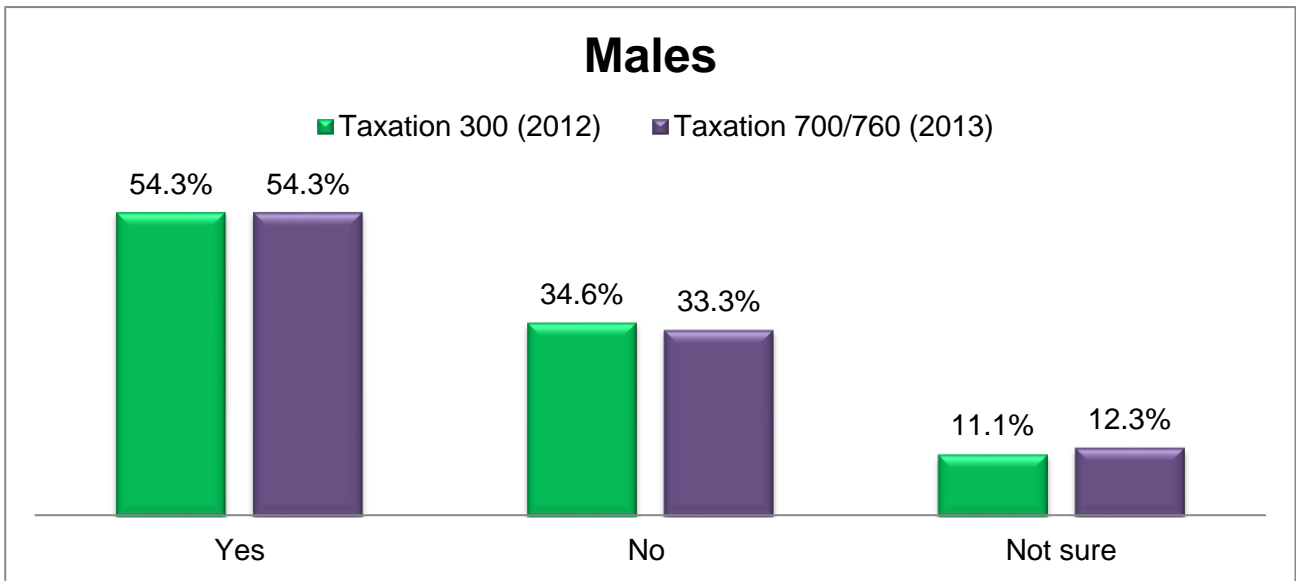
Gender	N (number of students)	Standard deviation	t value	df (Degrees of freedom)	Sig. (2- tailed)	Eta- square statistic
Male	81	1.0724	-1.865	80	0.66	0.0417
Female	108	0.9779	-3.641	107	0.00	0.1102

The Kappa test value for the entire group is calculated as 0.2163. This value is smaller than 0.5, indicating poor agreement between each student's individual responses as reflected in the two scores. According to the cross-tabulation table, only 48.7% of the students recorded the same response in Questionnaire (i) and Questionnaire (ii) and 51.3% changed their initial response in Questionnaire (i) compared to the latest response in Questionnaire (ii).

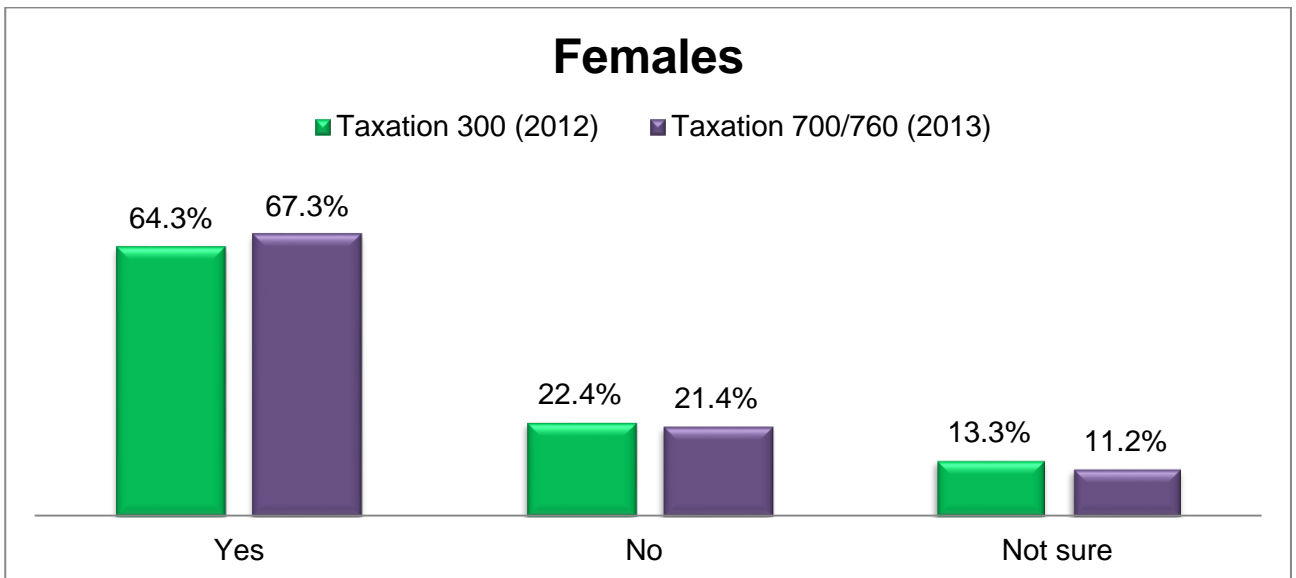
*Taxation 700/760 students' views on whether the University should consider building the cost of an Apple iPad into the tuition fees, compared to their responses in 2012*

The majority of the students (60.8%) still indicated that they believe the University of Pretoria should consider building the cost of an Apple iPad into their tuition fees, with the female students (67.3%) expressing a slightly higher level of interest compared to the male students. Figures 10 and 11 illustrate that there was not much of a difference between the responses captured in Questionnaire (i) and the responses captured in Questionnaire (ii). At most, there was a 3% difference in the responses captured during the two periods.

**Figure 10: Taxation 700/760 male students' views on whether the University should consider building the cost of an Apple iPad into the tuition fees, compared to their responses in 2012**



**Figure 11: Taxation 700/760 female students' views on whether the University should consider building the cost of an Apple iPad into the tuition fees, compared to their responses in 2012**



The data compared indicate a 14.3% positive change where students changed from a *No* or *Not Sure* in Questionnaire (i) to a *Yes* in Questionnaire (ii). However, a 12.6% negative change was captured where students changed from a *Yes* in Questionnaire (i) to a *No* or *Not Sure* in Questionnaire (ii), as seen in Table 22.

**Table 22: The change in students' views on whether the University should consider building the cost of an Apple iPad into the tuition fees**

Indicator	
Still <i>YES</i>	46.6%
From <i>NO</i> or <i>NOT SURE</i> to <i>YES</i>	14.3%
Still <i>NO</i> or <i>NOT SURE</i>	26.5%
From <i>YES</i> to <i>NO</i> or <i>NOT SURE</i>	12.6%

A Paired Sample t-test (Table 23) produced probability (p) values (sig. 2-tailed) of 0.892 and 0.618 for male and female students respectively, which are larger than the alpha value of 0.05. It is concluded that there is no significant difference between the students' responses as reflected by the two scores captured at the two different time periods. The Eta-square statistics calculated on both male (0.0017) and female (0.0023) scores are smaller than 0.06, indicating a small effect in the difference between responses from Questionnaire (i) and Questionnaire (ii).

**Table 23: Paired Sample t-test for Question 17 in Questionnaire (i), compared to Question 6 in Questionnaire (ii)**

Gender	N (number of students)	Standard deviation	t value	df (Degrees of freedom)	Sig. (2-tailed)	Eta-square statistic
Male	81	0.8138	-0.37	80	0.892	0.0017
Female	108	0.7725	0.498	107	0.619	0.0023

The Kappa test calculated a value of 0.3641, which is smaller than 0.5. It is therefore concluded that there is a poor agreement between students' individual responses as reflected by the two scores. This is supported by the cross-tabulation table, indicating that 34.9% of the respondents changed their responses between Questionnaire (i) and Questionnaire (ii) and only 65.1% of the students gave the same answer in both questionnaires.

#### 4.4.3 Summary

The aim of Questionnaire (ii) was to determine whether students would show a change in acceptance towards a mobile learning environment, compared to their responses captured by Questionnaire (i). Questionnaire (ii) was compared with Questionnaire (i) with an emphasis on the following four areas:

1. Students' interest in carrying out some class learning activities through mobile learning, using an Apple iPad, iPhone or tablet with wireless internet connection
2. Students' interest in purchasing textbooks in electronic format for loading onto a mobile device as opposed to a preference for studying from hardcopy textbooks
3. Students' interest in using the Tax Legislation Handbook (Act) in electronic format (loaded on a tablet for example) as opposed to using the hardcopy during open-book assessments
4. Students' views on whether they believe that the University of Pretoria should consider building the cost of an Apple iPad into the tuition fees

From the findings of Questionnaire (ii) compared to the responses analysed from Questionnaire (i) it is clear that there has been no significant change in acceptance and willingness to engage with a mobile learning environment among male students. Female students showed a significant change in areas 2 and 3. However, the Kappa test showed a poor agreement for all four areas. This means that individual responses to Questionnaire (ii) changed in comparison with the responses captured in Questionnaire (i) but the overall responses remained within 20% of the initial responses.

Area 1 showed an overall 5.8% positive change (16% positive change less 10.2% negative change) and Area 4 showed only a 1.7% positive change (14.3% positive change less 12.6% negative change). Findings from area 2 indicated that on average 9.3% fewer students prefer only the electronic version of the textbook whereas there was an average increase of 13.3% in responses indicating that they would prefer to have both a hardcopy and an electronic version textbook to study from. Findings from area 3 indicated that on average 15.6% fewer students prefer only the electronic version of the textbook whereas there was an average increase of 22.1% in responses indicating that they would prefer both the hardcopy and the electronic version of the textbook to use during open-book assessments.

#### **4.5 CONCLUSION**

This chapter aimed to explore students' acceptance level and willingness to engage with a mobile learning environment. The chapter analysed and discussed the findings and

responses obtained by means of two well-structured questionnaires. A total of 400 completed questionnaires were captured and analysed during the first survey period. During the second survey period 267 completed questionnaires were received but only 189 were captured and analysed.

Firstly, the researcher considered third-year undergraduate Commerce students' perceptions of what they believe "mobile learning" to be and whether any gender differences exist. The findings showed that a majority (more than 50%) of the students indicated that they believe the five listed activities to be a form of mobile learning. It was therefore concluded that all five activities represent a form of mobile learning as defined in this study. The following activity was the only activity moderated by gender, in that it was significant for women and not for men, showing an 11.9% difference between female and male responses:

- Using a web-enabled cell phone to read postings by other students and to post your own contribution to a discussion board.

The researcher then considered whether students were willing to engage with a mobile learning environment and whether any gender differences exist. It was concluded that a majority of 67.5% of third-year undergraduate Commerce students were interested in engaging with a mobile learning environment. It was also concluded that significantly more males than females were interested in using mobile technologies for educational purposes.

Finally, the researcher considered possible changes in acceptance towards and willingness to engage with a mobile learning environment over two different years of study. It was concluded that overall no significant change in acceptance and willingness to engage with a mobile learning environment exists among male students. Female students' responses, however, indicated a significant change in two of the four areas.

The final chapter focuses on the significant findings obtained from this study, the hypotheses and recommendations for future research.

## CHAPTER 5

### CONCLUSION

#### 5.1 INTRODUCTION

The main purpose of this exploratory study was to determine whether Taxation Commerce students would be willing to engage with a mobile learning environment. The study investigated whether students were already making use of mobile devices as an educational tool and if not whether they were willing to engage with a mobile learning environment when given the opportunity. The study also examined students' perceptions of what they believe mobile learning to be, and set out to discover whether gender differences in perception exist. The focus of this study was to gain an understanding of students' perceptions of and their acceptance towards mobile learning. The study lastly evaluated whether students showed a change in acceptance and willingness to engage with a mobile learning environment over two different academic years.

The following research objectives were chosen:

- To evaluate students' perceptions of what they believe "mobile learning" to be.
- To determine whether students are willing to engage with a mobile learning environment.
- To evaluate a possible change in acceptance towards and willingness to engage with a mobile learning environment over two different years of study.

The study also aims to test the following three hypotheses:

- Students, when given the opportunity, will usually respond more positively towards engaging with a mobile learning environment
- There is a difference in levels of acceptance towards engaging with a mobile learning environment between males and females.
- Students will show a positive change in acceptance towards and willingness to engage with a mobile learning environment as they become more familiar with their specific learning environment.



This chapter summarised the findings in order to draw conclusions and to test the hypotheses. A summary of the methodology, the contribution of this study and suggestions for future research are offered in this chapter.

## 5.2 METHODOLOGY

The study was a basic, empirical and longitudinal study which was conducted by means of two self-completion questionnaires. This study made use of two questionnaires which were distributed to the same participants at two different time periods to determine how their views on and acceptance towards engaging with a mobile learning environment have changed. The target population for this study was the undergraduate Commerce students enrolled for Taxation 300 in 2012 and the postgraduate Commerce students enrolled for Taxation 700/760 in 2013. These participants were first surveyed in 2012 and then again in 2013.

This study replicated, in a South African context, the study by Croop (2008) that was undertaken in the United States of America. Similar questions to those used by Croop (2008) which were slightly adapted for the specific target population and learning environment, were included in the data collection instrument of the current study.. The study is therefore not a complete replication of Croop's (2008) study.

In 2012, 400 students out of the total population of 552 participated. The sample size for the first questionnaire amounted to 72% of the total population. In 2013, 267 students participated and completed the second questionnaire. Of the 267 completed questionnaires, 189 students also completed the first questionnaire administered in 2012. The study only focused on the 400 initial responses and the responses of the 189 students who participated in both rounds to evaluate a possible change in their responses to the first questionnaire compared to their responses to the second questionnaire.

The study followed a basic research approach as only quantitative data were collected. Question 13.1 in the first questionnaire was an open-ended question, but nevertheless the researcher analysed, grouped and coded the responses of the participants.

The analysis and discussion of the relevant quantitative data captured were done using cross-tabulations of the different variables. In all the cross-tabulations carried out, the data were thoroughly studied for any significant patterns. The data were analysed using SAS, Microsoft Excel and IBM SPSS Statistics. The Chi-square test for independence, Paired Sample t-test, Eta-square and Kappa Measure of Agreement statistical tests were performed to validate this study.

This exploratory study cannot be generalised to all students in South Africa or the rest of the world who are studying at different tertiary educational institutions in different disciplines since the findings may differ if the same study is done on a different population group. Although there is no assurance that the participants answered the questions truthfully, the information gathered from the participants' answers was reliable and enabled the researcher to reach a proper conclusion.

### **5.3 SUMMARY OF FINDINGS**

The following main findings emerged from the first questionnaire:

- With the exception of two students (0.5%), all the other respondents own some sort of mobile device.
- Only 34.9% of the students indicated that they make use of a mobile device, such as an Apple iPad or tablet during their Taxation 300 lectures. The majority, 83.8%, of the students who use a mobile device during Taxation 300 lectures use their mobile device to load lecture material to view during lectures. According to the Chi-square test it was found that no gender difference exists regarding the use of mobile devices during the Taxation 300 lectures.
- A majority of the Taxation 300 students believe that the five learning activities listed in the questionnaire represent some form of mobile learning. Significantly more female students (89.7%) believe that using a web-enabled cell phone to read postings by other students and to post your own contribution to a discussion board that is a required activity of a class they are taking is a form of mobile learning.
- Interestingly, 67.5% of the Taxation 300 students are interested in engaging with a mobile learning environment. According to the Chi-square test, a gender difference

exists. Significantly more males are interested in using mobile technologies for educational purposes than females are.

- Only 15.8% of students indicated that they would only purchase the electronic version of the textbook, whereas 46.1% indicated that they would purchase both the electronic version and a hardcopy textbook to study from. It was concluded that no gender difference exists.
- The responses indicate that 40.2% of the Taxation 300 students feel that they would prefer the hardcopy textbook for use during open-book assessments, whereas 26.6% indicated that they would prefer to use both the electronic version and the hardcopy textbook in an open-book assessment. It was concluded that no gender difference exists.
- A majority of 59.6% of the students believe that the University should consider building the cost of a mobile device into their tuition fees. Of the 29.3% of students who indicated that the University should not consider building the cost of a mobile device into their tuition fees, 5.5% finance their own studies. It was concluded that no gender difference exists.

The following main findings emerged from the second questionnaire:

- Only 1.6% of students used a mobile device during their Taxation 700/760 lecture on which to load lecture notes to view during lectures, compared to 83.8% who used a mobile device in Taxation 300 during the previous academic year. It was found that no gender difference exists.
- There was no significant change in the students' interest in engaging with a mobile learning environment compared to their responses as captured by the first questionnaire. A 16% positive change was captured where students changed from a *No* or *Not Sure* in Questionnaire (i) to a *Yes* in Questionnaire (ii). However, a 10.2% negative change was captured where students changed from a *Yes* in Questionnaire (i) to a *No* or *Not Sure* in Questionnaire (ii). The Paired Sample t-test concluded that there is no significant difference between the students' responses as reflected by the two scores captured at two different time periods on engaging with a mobile learning environment.
- Although there was a slight change in the individual responses between 2012 and 2013 regarding study from an electronic textbook, no significant difference exists between

the male responses reflected by the two scores. There is, however, a significant difference between female students' responses as reflected by the two scores where a decrease in the female students' interest in using the electronic version of textbooks was captured.

- The majority of 60.8% of the Taxation 700/760 students still indicated that they believed the University of Pretoria should consider building the cost of mobile device into their tuition fees. Female students expressed a slightly higher level of interest compared to male students, which is interesting to note since female students appear to be less interested in engaging with a mobile learning environment. No significant difference was captured between the students' responses as reflected by the two scores captured at the two different time periods regarding this issue.

In general Taxation students are interested in and willing to engage with a mobile learning environment.

## 5.4 HYPOTHESES

The study formulated three hypotheses to be tested by the research findings. Each hypothesis is discussed below, and an indication is given whether it has been accepted or rejected.

*Hypothesis 1: Students, when given the opportunity, will usually respond more positively towards engaging with a mobile learning environment*

The results show that the majority of the Taxation 300 students and the majority of the Taxation 700/760 students are willing to engage with a mobile learning environment. This means that the hypothesis is accepted.

*Hypothesis 2: There is a difference in levels of acceptance towards engaging with a mobile learning environment between males and females.*

The Chi-square test was conducted to determine whether gender differences exist regarding mobile learning. The following areas indicated that a gender difference does exist:

- Significantly more female students believe that using a web-enabled cell phone to read postings by other students and to post your own contribution to a discussion board that is a required activity of a class they are taking is a form of mobile learning.
- Significantly more males are interested in using mobile technologies for educational purposes compared to females.

Regarding the use of mobile devices during Taxation 300 lectures, using electronic version textbooks or hardcopy textbooks and whether the University should consider building the cost of a mobile device into their tuition fees, no gender differences appear to exist.

The results of testing this hypothesis are therefore inconclusive.

*Hypothesis 3: Students will show a positive change in acceptance towards and willingness to engage with a mobile learning environment as they become more familiar with their specific learning environment.*

The Paired Sample t-test was conducted to determine whether response differences exist between the students' initial response in the first questionnaire and their response in the second questionnaire. No response difference exists regarding the entire respondent group. The following response difference, however, exists:

- A significant difference was captured between female students' responses in the first questionnaire and their responses in the second questionnaire regarding the use of electronic version textbooks.

Since no significant response difference exists in all other areas tested, it is therefore concluded that hypothesis 3 must be rejected.

## **5.5 CONTRIBUTION OF THIS STUDY**

Several studies have been undertaken in other countries on students' behaviour towards mobile learning. There is however, a dearth of research findings in respect of Taxation students' acceptance and willingness to engage with a mobile learning environment, especially in the context of South Africa. This study is also the first longitudinal study of its kind in South Africa.

This study adds to the existing body of knowledge on students' acceptance of and willingness to engage with a mobile learning environment. Taxation lecturing styles should be adapted to improve students' learning experience by implementing new technologies and mobile learning (Schmulian, 2008:33). It is unthinkable to educate students using outdated learning approaches (Dr Lieb Liebenberg interviewed by Rademeyer, 2012:8). This study can thus assist educators to create a mobile learning environment and effectively improve students' learning experience. The study could also influence the decision on whether textbooks and class notes should still be made available in hardcopy or whether electronic formats should be made available for students to access via their mobile devices. A further application is that the study could assist SAICA, SAIT and the University of Pretoria when considering the question whether to allow students to use a mobile device during their studies and during tests and exams.

The study could also assist publishers who wish to provide electronic version textbooks for students to access using a mobile device. This would reduce the demand for printed material and ultimately benefit our environment.

## **5.6 SUGGESTIONS FOR FUTURE RESEARCH**

The following areas are suggested for future research:

- Conducting the same study with tertiary educators as the targeted population to obtain their perceptions and acceptance of mobile learning and to determine whether they would be willing to provide and implement a mobile learning environment for their students.
- Conducting the same study among students but in different academic fields. The perception of students may differ among different academic fields and research might be needed to ascertain the perceptions of the use of mobile devices by students in fields other than Taxation.
- Conducting a study to determine whether high school pupils who are familiar with a mobile learning environment will have a higher acceptance level of mobile learning in tertiary institutions.
- Researching the academic uses of mobile technologies in higher education.

- Researching the effect mobile learning might have on students' academic achievements.
- Researching the opportunities and challenges South African students attach to mobile learning.
- Researching requirements for successfully implementing a mobile learning environment.

## **5.7 FINAL CONCLUSION**

This study aimed to explore students' acceptance level and willingness to engage with a mobile learning environment. Furthermore, the study considered a possible change in acceptance towards and willingness to engage with a mobile learning environment over two different years of study.

Students, when given the opportunity, are interested in engaging with a mobile learning environment. It was also concluded that significantly more males are interested in using mobile technologies for educational purposes than are females. It was lastly concluded that overall no significant change in acceptance of and willingness to engage with a mobile learning environment exists.

This study could ultimately encourage educators to create a mobile learning environment and effectively improve students' learning experience.

## LIST OF REFERENCES

- Banister, S. 2010. Integrating the iPod Touch in K–12 Education: Visions and Vices. In: *Computers in the Schools*. USA: Routledge. [Online] Available from: <http://dx.doi.org/10.1080/07380561003801590> [Accessed: 2012-01-19].
- Barry, F. 2011. *The rise of mobile* [Online] Available from: <http://www.netwitstinktank.com/mobile/the-rise-of-mobile.htm> [Accessed: 2012-07-12].
- Baya, N. & Daher, W. 2009. Students' Perceptions of Mathematics learning using mobile phones. In: *IMCL International Conference on Mobile and Computer aided Learning*. Jordan 21–24 April:79-87. [Online] Available from: <http://staff.najah.edu/sites/default/files/Students%20Perceptions%20of%20Mathematics%20Learning%20Using%20Mobile%20Phones.pdf> [Downloaded: 2012-03-16].
- Bowen, R. 2013. *Will e-books take over the world?* [Online] Available from: <http://www.jungleredwriters.com/2013/08/will-e-books-take-over-world.html> [Accessed: 2013-12-13].
- Brand, J. & Kinash, F. 2010. Pad-agogy: A quasi-experimental and ethnographic pilot test of the iPad in a blended mobile learning environment. *Proceedings Ascilite Sydney*, 147-151. [Online] Available from: <http://epublications.bond.edu.au/cgi/viewcontent.cgi?article=1015&context=tls> [Downloaded: 2012-01-19].
- Bullas, J. 2011. *29 Statistics reveal how the Apple's iPad is changing our lives*. [Online] Available from: <http://www.jeffbullas.com/2011/04/04/29-statistics-reveal-how-the-apples-ipad-is-changing-our-lives/> [Accessed: 2012-07-12].
- Campbell, S.W. 2006. Perceptions of mobile phones in college classrooms: ringing, cheating and classroom policies. *Communication Education*, 55(3):280-294. [Online] Available from: <http://dx.doi.org/10.1080/03634520600748573> [Accessed: 2012-03-16].



Cancio, C. n.d. *Are e-readers making books obsolete?* [Online] Available from: <http://electronics.howstuffworks.com/gadgets/other-gadgets/e-readers-making-books-obsolete1.htm/printable> [Accessed: 2013-12-13].

Clark, R.C. & Mayer, R.E. 2011. *E-learning and the science of instruction: Proven guidelines for consumers and designers of multimedia learning*. 3<sup>rd</sup> ed. San Francisco: Pfeiffer. [Online] Available from: [http://books.google.co.za/books?hl=en&lr=&id=twoLz3jlkRgC&oi=fnd&pg=PR17&dq=clark+Mayer+e-learning+2011&ots=MdG1nlZzmq&sig=9ON9l3N\\_brg\\_duwyzEWB50Evnog#v=onepage&q=clark%20Mayer%20e-learning%202011&f=false](http://books.google.co.za/books?hl=en&lr=&id=twoLz3jlkRgC&oi=fnd&pg=PR17&dq=clark+Mayer+e-learning+2011&ots=MdG1nlZzmq&sig=9ON9l3N_brg_duwyzEWB50Evnog#v=onepage&q=clark%20Mayer%20e-learning%202011&f=false) [Downloaded: 2013-09-19].

Cooper, D.R. & Schindler, P.S. 2011. *Business research methods*. 11<sup>th</sup> International ed. New York, NY: McGraw-Hill.

Croop, F.J. 2008. *Student perception related to mobile learning in higher education*. Unpublished doctoral thesis. Arizona: Northcentral University. [Online] Available from ProQuest: <http://search.proquest.com/docview/304819097> [Downloaded: 2012-03-16].

Daniel, J. 2012. *Sampling essentials: practical guidelines for making sample choices*. Thousand Oaks, CA: Sage.

Dewan, P. 2012. Are books becoming extinct in academic libraries? *Emerald*, 113(1/2):27-37. [Online] Available from: <http://www.emeraldinsight.com/journals.htm?articleid=17009705&show=abstract> [Downloaded: 2013-12-13].

Du Preez, H. & Du Preez, C.S. 2012. Taxation students' perceptions of open-book assessment prior to the qualifying examination of South African Chartered Accountants. *SA Journal of Accounting Research*, 26(1):119-142.

Educause Learning Initiative. 2010. *Mobile learning: context and prospects. A report on the ELI focus session*. [Online] Available from: [www.oerafrica.org/ResourceDownload.aspx?id=38760](http://www.oerafrica.org/ResourceDownload.aspx?id=38760) [Downloaded: 2012-07-05].

Engelbrecht, E. 2005. Adapting to changing expectations: post-graduate students' experience of an e-learning tax program. *Computers & Education*, 45:217-229. [Online] Available from: Elsevier: Science Direct: <http://pdn.sciencedirect.com/science/article/pii/S0360131504000995> [Downloaded: 2012-01-19].

Fahad, N. 2009. Students' attitudes and perceptions toward the effectiveness of mobile learning in King Saud University, Saudi Arabia. *The Turkish Online Journal of Education Technology*, 8(2):111-119. [Online] Available from: TOJET: <http://www.tojet.net/volumes/v8i2.pdf#page=112> [Downloaded: 2012-03-16].

Garrison, D.R. 2011. *E-learning in the 21<sup>st</sup> Century: A framework for research and practice*. 2<sup>nd</sup> ed. New York. NY: Routledge. [Online] Available from: <http://books.google.co.za/books?id=aodjWyjxYbYC&printsec=frontcover&dq=Garrison+e-learning+2011&hl=en&sa=X&ei=BsbcUoaTOYyKhQf20ICyDg&ved=0CEgQ6AEwAA#v=onepage&q=Garrison%20e-learning%202011&f=false> [Downloaded: 2013-09-19].

Go Green Initiative, n.d. *Think Green*. [Online] Available from: <http://www.go-green.ae/thinkgreen.php> [Accessed: 2012-07-09].

GroupeSpeciale Mobile Association (GSMA). 2011. *Africa Now the World's Second Largest Mobile Market, Reports GSMA*. [Online] Available from: <http://www.gsma.com/newsroom/africa-now-the-worlds-second-largest-mobile-market-reports-gsma/> [Accessed: 2012-07-05].

iTunes store. N.d. Search: Universities. [Online] Available from: [www.apple.com/itunes/download/](http://www.apple.com/itunes/download/) [Accessed: 2012-06-05].

Jordaan, D. 2012. *Mobile Launch 24 May 2012*. Open lecture on 2012-05-24.

Keegan. D. 2005. *Mobile learning: the next generation of learning*. [Online] Available from: Ericssons.net: [http://scholar.google.co.za/scholar?start=20&q=Perceptions+of+mobile+learning&hl=en&as\\_sdt=0,5](http://scholar.google.co.za/scholar?start=20&q=Perceptions+of+mobile+learning&hl=en&as_sdt=0,5) [Downloaded: 2012-03-16].

Kotzé, T.G. 2013. *Key research terms for class meeting 3 & 4*. Lecture to the NME 703 class on 2013-04-08.

Lai, J. & Chang, C. 2011. User attitudes toward dedicated e-book readers for reading: the effects of convenience, compatibility and media richness. *Emerald* 35(4):558-580. [Online] Available from: [http://www.emeraldinsight.com/case\\_studies.htm/case\\_studies.htm?articleid=1944262&show=html](http://www.emeraldinsight.com/case_studies.htm/case_studies.htm?articleid=1944262&show=html) [Downloaded: 2013-12-13].

Lamprecht, I. 2012. E-Leer kan bydrae tot onderrig. *Rapport Loopbane*, 5 Februarie 2012:1.

Laouris, Y. & Eteokleous, N. 2005. *We need an educationally relevant definition of mobile learning*. [Online] Available from: <http://mlearning.noe-kaleidoscope.org/public/mlearn2005/www.mlearn.org.za/CD/papers/Laouris%20%26%20Eteokleous.pdf> [Downloaded: 2012-03-16].

Liaw, S., Hatala, M. & Huang, H. 2010. Investigating acceptance toward mobile learning to assist individual knowledge management: based on activity theory approach. *Computers and Education*, 54:446-454. [Online] Available from: Elsevier: Science Direct: <http://pdn.sciencedirect.com/science/article/pii/S0360131509002358> [Downloaded: 2012-01-26].

Liaw, S., Huang, H. & Chen, G. 2007. Surveying instructor and learner attitudes toward e-learning. *Computers and Education* 49:1066-1080. [Online] Available from: Elsevier: Science direct: <http://pdn.sciencedirect.com/science/article/pii/S036013150600014> [Downloaded: 2012-01-26].

M-learning.org. n.d. *Definition of mobile learning*. [Online] Available from: <http://www.m-learning.org/knowledge-centre/whatismlearning> [Accessed: 2012-04-05].

Nelson, M.R. 2008. E-books in higher education: nearing the end of the era of hype? *Educause Review* 43(2). [Online] Available from: [https://intranet.ebc.edu.mx/contenido/faculty/archivos/impacto\\_cultural\\_140512.pdf](https://intranet.ebc.edu.mx/contenido/faculty/archivos/impacto_cultural_140512.pdf) [Downloaded: 2013-12-13].

Oberholzer, R. 2008. Attitudes of South African taxpayers towards taxation: a pilot study. *Accountancy Business and the Public Interest*, 7(1):44-69. [Online] Available from: <http://visar.csustan.edu/aaba/Oberholzer2008.pdf> [Downloaded: 2012-03-16].

O'Mally, C., Vavoula, G., Glew, J.P., Taylor, J., Sharples, M. & Lefrere, P. 2003. Guidelines for learning/teaching/tutoring in a mobile environment. *Moblearn*, 10 June 2003:1-57. [Online] Available from: <http://www.mobilearn.org/download/results/guidelines.pdf> [Downloaded: 2012-07-13].

Oxforddictionaries. n.d<sup>a</sup>. *Acceptance*. [Online] Available from: <http://oxforddictionaries.com/definition/Acceptance?q=acceptance> [Accessed: 2013-06-25].

Oxforddictionaries. n.d<sup>b</sup>. *Perception*. [Online] Available from: <http://oxforddictionaries.com/definition/perception?q=perception> [Accessed: 2012-04-05].

Oxforddictionaries. n.d<sup>c</sup>. *Willingness*. [Online] Available from: <http://oxforddictionaries.com/definition/Willingness?q=willingness> [Accessed: 2013-06-25].

Pallant, J. 2011. *SPSS survival manual: a step by step guide to data analysis using the SPSS program*. 4<sup>th</sup> ed. Crows Nest, NSW: Allen & Unwin.

Rademeyer, A. 2012. Die iPad-klas: skool se Gr. 10's kry onderrig op tablette. *Beeld*, 23 Februarie 2012:8.

Rowlands, I., Nicholas, D., Jamali, H.R. & Huntington, P. 2007. What do faculty and students really think about e-books? *Emerald*59(6):489-511. [Online] Available from: <http://www.emeraldinsight.com/journals.htm?articleid=1640587&show=abstract> [Downloaded: 2013-12-13].

Saunders, M., Lewis, P. & Thornhill, A. 2007. *Research methods for business students*. 4<sup>th</sup> ed. Harlow, Essex: Pearson Education.

Schmullian, A. 2008. *Class absenteeism: a survey of the reasons for non-attendance and the effect thereof on academic performance*. Unpublished Master's thesis. Pretoria: University of Pretoria.

Sharples, M., Taylor, J. & Vavoula, G. 2005. *Towards a theory of mobile learning*. [Online] Available from: <http://www.mlearn.org.za/CD/papers/Sharples-%20Theory%20of%20Mobile.pdf> [Downloaded: 2012-03-16].

Smusiak, C. n.d. *Good call! Using your mobile phone for green activism*. [Online] Available from: <http://tlc.howstuffworks.com/home/good-call-mobile-phone.htm> [Accessed: 2012-07-09].

South African Institute for Tax Professionals (SAIT). 2013. *Official website* [Online] Available from: [www.thesait.org.za](http://www.thesait.org.za) [Accessed: 2013-09-25].

South African Institute of Chartered Accountants (SAICA). 2013. *Official website* [Online] Available from: [www.saica.co.za](http://www.saica.co.za) [Accessed: 2013-09-25].

Stiglingh, M. (ms@up.ac.za) 2012. Feedback from the previous head of Accounting departments in the country meeting with SAICA. [email to] Dos Santos, J (juanita.dossantos@up.ac.za) 2012-10-31.

Thayer, A., Lee, C.P., Hwang, L.H., Sales, H., Sen, P. & Dalal, N. 2011. *The Imposition and Superimposition of Digital Reading Technology: The Academic Potential of E-readers*. Paper presented at the Session: Reading and Writing, Vancouver, 7-12 May: 2917-2926. [Online] Available from: [http://delivery.acm.org/10.1145/1980000/1979375/p2917-thayer.pdf?ip=137.215.6.53&id=1979375&acc=ACTIVE%20SERVICE&key=C2716FEBFA981EF1461B926609D80C18FBD4139E3D284089&CFID=388540162&CFTOKEN=67567363&\\_\\_acm\\_\\_=1386925046\\_27aa6d4e8c1dcda4d50f1ca48ea87d54](http://delivery.acm.org/10.1145/1980000/1979375/p2917-thayer.pdf?ip=137.215.6.53&id=1979375&acc=ACTIVE%20SERVICE&key=C2716FEBFA981EF1461B926609D80C18FBD4139E3D284089&CFID=388540162&CFTOKEN=67567363&__acm__=1386925046_27aa6d4e8c1dcda4d50f1ca48ea87d54) [Downloaded: 2013-12-13].

Theophilides, C. & Koutselini, M. 2000. Study Behavior in the Closed-Book and the Open-Book Examination: A Comparative Analysis. *Educational Research and Evaluation*,

6(4):379-393. [Online] Available from: <http://dx.doi.org/10.1076/edre.6.4.379.6932> [Downloaded: 2012-01-19].

The Skills Portal. 2011. *Skills shortage grim in finance sector*. [Online] Available from: [http://www.skillsportal.co.za/page/training/training\\_companies/financial\\_accounting\\_training/363999-Skills-shortage-grim-in-finance-sector](http://www.skillsportal.co.za/page/training/training_companies/financial_accounting_training/363999-Skills-shortage-grim-in-finance-sector) [Accessed: 2012-07-05].

Traxler, J. 2007. Defining, discussing, and evaluating mobile learning. *International Review of Research in Open and Distance Learning*, 8(2):1-12. [Online] Available from: <http://www.irrodl.org/index.php/irrodl/article/view/346/882> [Downloaded: 2013-07-04].

Tsunke, S. 2012. *University of Pretoria launches a new mobile application*. [Online] Available from: <http://web.up.ac.za/default.asp?ipkCategoryID=8641&articleID=11953> [Accessed: 2012-07-13].

University of Pretoria. 2012. *Taxation 300 class list*. Faculty Admin of the Economics and Management Sciences Faculty. Pretoria: Department of Taxation, University of Pretoria.

University of Pretoria. 2013<sup>a</sup>. *Taxation 760/770 Class list*. Faculty Admin of the Economics and Management Sciences Faculty. Pretoria: Department of Taxation, University of Pretoria.

University of Pretoria. 2013<sup>b</sup>. *Taxation 700/760 – Learners' manual*. Pretoria: Department of Taxation, University of Pretoria.

University of Pretoria. 2013<sup>c</sup>. *Research Methodology 703 – Study guide and course notes*. Pretoria: Department of Marketing Management, University of Pretoria.

University of the Witwatersrand. 2011. *Mobile learning*. [Online] Available from: <https://elearn.wits.ac.za/home/default/news/mlearning> [Accessed: 2012-07-05].

Vlok, P. 2012. Tatta Tas, Hallo Tablet. *Huisgenoot* 22 Maart 2012:22-23.

Wang, M., Shen, R., Novak, D. & Pan, X. 2009. The impact of mobile learning on students' learning behaviours and performances: Report from a large blended classroom. *British Journal of Education Technology*: 40(4): 673-695. [Online] Available from: <http://onlinelibrary.wiley.com/doi/10.1111/j.1467-8535.2008.00846.x/pdf> [Downloaded: 2012-03-16].

Wang, Y., Wu, M. & Wang, H. 2009. Investigating the determinants and age and gender differences in the acceptance of mobile learning. *British Journal of Education Technology*, 40(1):92-118. [Online] Available from: <http://0-onlinelibrary.biley.com.innopac.up.ac.za/doi/10.1111/j.1467-8535.2007.00809.x/pdf> [Downloaded 2013-11-08].

Ylijoki, O. 2000. Disciplinary cultures and the moral order of studying – a case of four Finnish university departments. *Higher Education*, 39(3):339-362 [Online] Available from: <http://www.jstor.org/stable/3447915?seq=2> [Accessed 2012-07-09].

Zikmund, W.G. & Babin, B.J. 2010. *Essentials of marketing research*. 4<sup>th</sup> ed. Australia: South Western – Cengage Learning.

# **APPENDIX A**

## **Questionnaire (i)**

**- Data collection instrument(-s)  
&  
Informed consent form (cover page) -**



**Mobile devices: Taxation students' perception and acceptance of engaging with a mobile learning environment**

Respondent number	V1	
-------------------	----	--

Dear Respondent

You are invited to participate in an academic research study conducted by Juanita Venter (née Dos Santos), a lecturer and master's student from the Department of Taxation at the University of Pretoria.

The purpose of the study is to analyse the perception of taxation students towards the use of mobile devices (such as iPad, iPhone, tablets and smart phones) during their studies. In other words what your perception is towards a mobile learning environment.

This study involves an anonymous survey. Your name will not appear on the questionnaire and the answers you give will be treated as strictly confidential. Your student number will only help in linking any further surveys to your original survey. By completing this questionnaire you are giving your consent to participate in the study on a voluntary basis.

Please answer the questions in the attached questionnaire as completely and honestly as possible. This should not take more than 15 minutes of your time.

**Thank you for completing the survey. Your response is appreciated**

**Section A: DEMOGRAPHIC INFORMATION**  
Mark the applicable answer with an "X"

		<b>For office use</b>	
1. Student number :	<input type="text"/>	V2	<input type="text"/>
2. Please indicate your gender.		V3	<input type="text"/>
	Male <input type="checkbox"/> 1		
	Female <input type="checkbox"/> 2		
3. Please indicate your age. _____			
4. Please indicate to which population group you belong		V4	<input type="text"/>
	African / Black <input type="checkbox"/> 1		
	Coloured <input type="checkbox"/> 2		
	Indian <input type="checkbox"/> 3		
	White <input type="checkbox"/> 4		
	Other (please specify) _____ <input type="checkbox"/> 5		
5. Please indicate how your studies are financed. (You may tick more than one item).		V5.1	<input type="text"/>
	By parents <input type="checkbox"/> 1	V5.2	<input type="text"/>
	Bursary <input type="checkbox"/> 2	V5.3	<input type="text"/>
	Student or other loan <input type="checkbox"/> 3	V5.4	<input type="text"/>
	By yourself <input type="checkbox"/> 4	V5.5	<input type="text"/>
	Other (please specify) _____ <input type="checkbox"/> 5		

6. In what language do you attend the taxation module (BEL 300)?		V6	
English	1		
Afrikaans	2		
7. What type of mobile device do you own and use. (You may tick more than one item).		V7.1	
Apple iPad	1	V7.2	
Apple iPhone	2	V7.3	
Samsung Tablet	3	V7.4	
Blackberry Cellphone	4	V7.5	
Other cellphone, Please specify: _____	5	V7.6	
Other device, Please specify: _____	6	V7.7	
None (I do not own any mobile device)	7		

**Section B: Student's view of what they believe mobile learning is.**  
**Mark the applicable answer**

For purposes of question 8 – 12: Mobile learning is defined as “Any sort of learning that happens when the learner is not at a fixed, predetermined location, or learning that happens when the learner takes advantage of the learning opportunities offered by mobile technologies”(O'Mally, Vavoula, Glew, Taylor, Sharples and Lefrere, 2003). These mobile technologies include Apple iPad, iPhone and other tablets. Based on your understanding of mobile learning, indicate whether you believe the following activities would be an example of mobile learning:

8. Using a mobile device that is connected wirelessly to the internet while outside of class in the process of completing a research paper assignment.		V8	
Yes	1	No	2
		Not sure	3
9. Using a web-enabled cell phone to read postings by other students and to post your own contribution to a discussion board that is a required activity of a class you are taking.		V9	
Yes	1	No	2
		Not sure	3
10. Using a mobile device to record observations.		V10	
Yes	1	No	2
		Not sure	3
11. Loading textbooks in electronic format to be accessed on a mobile device and read by a student on his/her way to campus on a bus or on the train.		V11	
Yes	1	No	2
		Not sure	3
12. Taking a picture of lecture notes, that are not made available to students i.		V12	
Yes	1	No	2
		Not sure	3

**Section C: Student's attitudes towards using mobile device in their taxation module.**  
**Mark the applicable answer**

13. If you own an Apple iPad, Apple iPhone or any tablet, please indicate whether you use this device for educational purposes (during your taxation lectures).

Yes	1
No	2

13.1 If "Yes" (above), state how you are using this mobile device in the Taxation module.


14. Are you interested in the option of carrying out some of your class learning activities through mobile learning using aniPad, iPhone or tablet with wireless internet connection?

Yes	1	No	2	Not sure	3
-----	---	----	---	----------	---

15. Currently BEL 300 students are required to purchase the 2 textbooks in hardcopy to study from. Please indicate whether you would rather purchase the textbooks in electronic format to be loaded on a mobile device (iPad) or whether you still prefer the hardcopy to study from.

Electronic format to be loaded on an iPad	1
Hardcopy	2
Both electronically and hardcopy	3
Not sure	4

16. Currently BEL 300 students are not allowed to take any form of textbook into a test or exam. Next year (Honours) you will be allowed to take the Act with you into a test venue. Please indicate whether you would prefer to take in the Act in electronic format (loaded on an iPad) or still prefer to take in the hardcopy.

Electronic format to be loaded on an iPad	1
Hardcopy	2
Both electronically and hardcopy	3
Not sure	4

17. Do you feel that the University of Pretoria should consider building the cost of an iPad into the tuition fees for the BCom Accountancy Sciences degree? (Each student will then receive an iPad when enrolled for this degree).

Yes	1	No	2	Not sure	3
-----	---	----	---	----------	---

18. In your opinion do you believe that making use of mobile devices (iPad, iPhone or tablet) during your studies would influence your academic performance in taxation? (Increase or lower you mark in taxation).

Yes	1	No	2	Not sure	3
-----	---	----	---	----------	---

V13

V14

V15

V16

V17

V18

18.1 If “Yes” (above), would the use of mobile devices (iPad, iPhone or tablet) during your studies increase or lower your academic performance in taxation? (Will your mark be increased or will it lower).	V19	
	Increase your academic performance	1
	Lower your academic performance	2
	Undecided	3

Section D Student’s attitudes towards mobile learning.							
Reflect on the following statements about mobile learning. Indicate your position regarding each statement by circling the number which is closest to your view:  1. Strongly agree                      4. Disagree 2. Agree                                      5. Strongly disagree 3. Neutral	Strongly agree	Agree	Neutral	Disagree	Strongly disagree		
19. Mobile learning can be an effective method of learning as it can give immediate support.	1	2	3	4	5	V20	
20. Mobile learning will bring new opportunities of learning.	1	2	3	4	5	V21	
21. Mobile learning cannot be used for learning due to expenses involved in mobile learning.	1	2	3	4	5	V22	
22. Mobile learning will improve communication between student and student and between student and lecturer.	1	2	3	4	5	V23	
23. Mobile learning cannot be used for learning due to the workload on the student that may increase.	1	2	3	4	5	V24	
24. Mobile learning will equip the student to be better prepared for the real world of the present and future.	1	2	3	4	5	V25	
25. Mobile learning technologies have not been designed with education in mind and as a result confusion and miscommunication can occur when mobile technologies are employed in teaching and learning.	1	2	3	4	5	V26	
26. Mobile learning provides more portability at a lower cost.	1	2	3	4	5	V27	
27. Mobile learning will increase student motivation, focus and engagement.	1	2	3	4	5	V28	
28. Mobile learning can accommodate students with disabilities.	1	2	3	4	5	V29	
29. Mobile learning cannot be used for learning due to unavailability of mobile devices with a larger number of students.	1	2	3	4	5	V30	
30. Mobile learning is environment friendly.	1	2	3	4	5	V31	
31. Mobile learning cannot be used for learning due to poor networking on Campus.	1	2	3	4	5	V32	
32. Mobile learning will be more flexible method of learning as it can be done anytime, anywhere.	1	2	3	4	5	V33	
33. Mobile learning is a quicker method of getting feedback in learning.	1	2	3	4	5	V34	
34. Mobile learning cannot be used for learning due to continuous training needed in using these technologies.	1	2	3	4	5	V35	

35. List any other advantage (not listed above) you believe mobile learning will offer you as a student.	
36. List any other disadvantage (not listed above) you believe mobile learning will create for you as a student.	

## **APPENDIX B**

### **Questionnaire (ii)**

**- Data collection instrument(-s)  
&  
Informed consent form (cover page) -**

**Mobile devices: Taxation students' perception and acceptance of engaging with a mobile learning environment**

Respondent number	V1	
-------------------	----	--

Dear Respondent

You are invited to participate in a follow up questionnaire. This follow up questionnaire will be used in an academic research study conducted by Juanita Venter (née Dos Santos), a lecturer and master's student from the Department of Taxation at the University of Pretoria.

The purpose of the study is to analyse the perception of taxation students towards the use of mobile devices (such as iPad, iPhone, tablets and smart phones) during their studies. In other words what your perception is towards engaging into a mobile learning environment.

This study involves an anonymous survey. Your name will not appear on the questionnaire and the answers you give will be treated as strictly confidential. Your student number will only help in linking this survey to your original survey (conducted in November 2012). By completing this questionnaire you are giving your consent to participate in the study on a voluntary basis.

Please answer the questions in the questionnaire as completely and honestly as possible. This should not take more than 10 minutes of your time.

Please note: The term **mobile device** refer to any device such as a cell phone, smart phone, tablet (iPad, Samsung) and kindle etc.

For office use

**Section A: DEMOGRAPHIC INFORMATION**

1. Student number :	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	V2	<input type="text"/>
---------------------	----------------------	----------------------	----------------------	----------------------	----------------------	----------------------	----------------------	----------------------	----	----------------------

**Section B: Student's attitudes towards using mobile device in their taxation module. Mark the applicable answer**

2. If you own any mobile device, please indicate how you use this device during your taxation lectures by choosing the correct combination below.	V38	<input type="text"/>								
A. I use my mobile device during my taxation lectures to load lecture material on it in order to view during lectures and make additional notes.										
B. I use my mobile devices to view BEL 700/760 announcements on ClickUP and communicate with the lecturer and fellow students.										
<table border="1"> <tr> <td>Only A</td> <td>1</td> </tr> <tr> <td>Only B</td> <td>2</td> </tr> <tr> <td>A and B</td> <td>3</td> </tr> <tr> <td>None</td> <td>4</td> </tr> </table>	Only A	1	Only B	2	A and B	3	None	4		
Only A	1									
Only B	2									
A and B	3									
None	4									

<p>3. Are you interested in the option of carrying out some of your class learning activities through mobile learning using an iPad, iPhone or tablet with wireless internet connection?</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="border: 1px solid black; padding: 2px;">Yes</td> <td style="border: 1px solid black; width: 40px; text-align: center;">1</td> <td style="border: 1px solid black; padding: 2px;">No</td> <td style="border: 1px solid black; width: 40px; text-align: center;">2</td> <td style="border: 1px solid black; padding: 2px;">Not sure</td> <td style="border: 1px solid black; width: 40px; text-align: center;">3</td> </tr> </table>	Yes	1	No	2	Not sure	3	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%; text-align: right;">V39</td> <td style="width: 40%;"></td> </tr> </table>	V39			
Yes	1	No	2	Not sure	3						
V39											
<p>4. Currently you are required to purchase the 2 textbooks in hardcopy to study from. Please indicate whether you would rather purchase the textbooks in electronic format to be loaded on a mobile device or whether you still prefer the hardcopy to study from.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Electronic format to be loaded on a mobile device</td> <td style="width: 40px; text-align: center;">1</td> </tr> <tr> <td style="padding: 2px;">Hardcopy</td> <td style="text-align: center;">2</td> </tr> <tr> <td style="padding: 2px;">Both electronically and hardcopy</td> <td style="text-align: center;">3</td> </tr> <tr> <td style="padding: 2px;">Not sure</td> <td style="text-align: center;">4</td> </tr> </table>	Electronic format to be loaded on a mobile device	1	Hardcopy	2	Both electronically and hardcopy	3	Not sure	4	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%; text-align: right;">V40</td> <td style="width: 40%;"></td> </tr> </table>	V40	
Electronic format to be loaded on a mobile device	1										
Hardcopy	2										
Both electronically and hardcopy	3										
Not sure	4										
V40											
<p>5. Currently you are allowed to take the Tax legislation handbook (Act) with you into a test venue (open Act policy). Please indicate whether you would prefer the Tax legislation handbook (Act) in electronic format (loaded on a tablet for example) or still prefer the hardcopy to take into the exam / test venue.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Electronic format to be loaded on a mobile device</td> <td style="width: 40px; text-align: center;">1</td> </tr> <tr> <td style="padding: 2px;">Hardcopy</td> <td style="text-align: center;">2</td> </tr> <tr> <td style="padding: 2px;">Both electronically and hardcopy</td> <td style="text-align: center;">3</td> </tr> <tr> <td style="padding: 2px;">Not sure</td> <td style="text-align: center;">4</td> </tr> </table>	Electronic format to be loaded on a mobile device	1	Hardcopy	2	Both electronically and hardcopy	3	Not sure	4	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%; text-align: right;">V41</td> <td style="width: 40%;"></td> </tr> </table>	V41	
Electronic format to be loaded on a mobile device	1										
Hardcopy	2										
Both electronically and hardcopy	3										
Not sure	4										
V41											
<p>6. Do you feel that the University of Pretoria should consider building the cost of an iPad into the tuition fees for the BCom Accountancy Sciences degree? (Each student will then receive an iPad when enrolled for this degree).</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="border: 1px solid black; padding: 2px;">Yes</td> <td style="border: 1px solid black; width: 40px; text-align: center;">1</td> <td style="border: 1px solid black; padding: 2px;">No</td> <td style="border: 1px solid black; width: 40px; text-align: center;">2</td> <td style="border: 1px solid black; padding: 2px;">Not sure</td> <td style="border: 1px solid black; width: 40px; text-align: center;">3</td> </tr> </table>	Yes	1	No	2	Not sure	3	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%; text-align: right;">V42</td> <td style="width: 40%;"></td> </tr> </table>	V42			
Yes	1	No	2	Not sure	3						
V42											
<p>7. In your opinion do you believe that making use of mobile devices during your studies would influence your academic performance in taxation?</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="border: 1px solid black; padding: 2px;">Yes</td> <td style="border: 1px solid black; width: 40px; text-align: center;">1</td> <td style="border: 1px solid black; padding: 2px;">No</td> <td style="border: 1px solid black; width: 40px; text-align: center;">2</td> <td style="border: 1px solid black; padding: 2px;">Not sure</td> <td style="border: 1px solid black; width: 40px; text-align: center;">3</td> </tr> </table>	Yes	1	No	2	Not sure	3	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%; text-align: right;">V43</td> <td style="width: 40%;"></td> </tr> </table>	V43			
Yes	1	No	2	Not sure	3						
V43											
<p>7.1 If "Yes", (above) would the use of a mobile devices (iPad, iPhone or tablet) during your studies increase or lower your academic performance in taxation?</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Increase your academic performance</td> <td style="width: 40px; text-align: center;">1</td> </tr> <tr> <td style="padding: 2px;">Lower your academic performance</td> <td style="text-align: center;">2</td> </tr> <tr> <td style="padding: 2px;">Undecided</td> <td style="text-align: center;">3</td> </tr> </table>	Increase your academic performance	1	Lower your academic performance	2	Undecided	3	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%; text-align: right;">V44</td> <td style="width: 40%;"></td> </tr> </table>	V44			
Increase your academic performance	1										
Lower your academic performance	2										
Undecided	3										
V44											

**Thank you for completing the survey. Your response is appreciated**