

**A STUDY ON FACTORS INFLUENCING LEARNERS'
ADOPTION OF MOBILE LEARNING
IN BEIJING NORMAL UNIVERSITY, CHINA**

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Research report submitted in partial fulfillment of the requirements for
the degree of Master of Business Administration

UNIVERSITI SAINS MALAYSIA

2012

Dedication

This thesis is dedicated to my beloved family members and my lovely friends
for they are my source of inspiration, aspiration and motivation.....

ACKNOWLEDGEMENT

After almost a year of hard work and numerous obstacles encountered in the thesis writing process, I have finally completed this management project with the help of my classmates and teachers. I would like to express my deepest gratitude to my supervisor Dr Teoh Ai Ping. Her kind attention and selfless guidance has enabled me to complete my project efficiently. Dr Teoh has impressed me by her profound knowledge, amiable in manner and practical work style. She has shown great pains in guiding me on revision and improvement of the project. In addition, I would like to thank all lecturers, who has laid the foundation of business and management knowledge for me for the last two years, I have learned a lot.

I would also like to thank all scholars whose works have been quoted in this project for their research help and inspiration. Thanks to my classmates and friends, who provided me kind assistance with English and academic in the past two years, as well as given me enthusiastic help in my thesis writing.

My deepest appreciation goes to my dear parents, my forever supporter in life. It is your constant support and encouragement that I have managed to complete my academic pursuit in Graduate School of Business, Universiti Sains Malaysia. I am very grateful to both of you, thanks for your understanding and sharing when I met setbacks, sad, and confused. I hereby dedicate my loftiest respect to both my parents.

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Abstrak

Perkembangan teknologi Internet telah menggalakkan semakin banyak universiti di China menumpukan lebih perhatian dan pelaburan dalam pembelajaran bergerak. Manfaat pembelajaran bergerak tidak dapat dimaksimumkan melainkan sistem tersebut dipergunakan oleh pelajar. Para penyelidik mengkaji niat-tingkahlaku sebagai pengukuran kejayaan pembelajaran bergerak. Kajian ini cuba mendefinisikan pembelajaran bergerak, meninjau cirri-cirinya, serta meneliti keadaan pembelajaran bergerak di China. Melanjutkan model “Unified Theory of Acceptance and Use of Technology” (UTAUT), kajian ini memeriksa faktor-faktor (misalnya, jangkaan prestasi, jangkaan daya-usaha, pengaruh sosial, syarat-syarat fasilitasi, *self-efficacy*, pengurusan diri dalam pembelajaran, pencapaian nilai dan *perceived playfulness*, yang telah mempengaruhi niat tingkahlaku para pelajar dalam penggunaan pembelajaran bergerak di Beijing Normal University, China. Kajian ini memaparkan secara mendalam demi membantu perancangan dan keputusan strategik agar mempertingkatkan penerimaan dan penggunaan efektif pembelajaran bergerak di Beijing Normal University, China. Pendekatan “Partial-least-squares” dan “Structural Equation Modeling” telah digunakan untuk menilai model yang dicadangkan. Model hipotesis telah divalidasikan secara empirik melalui data yang dikumpulkan dari 211 pelajar di Pusat Pengajian Pengurusan di Beijing Normal University, China. Keputusannya mencadangkan bahawa niat-tingkahlaku para pelajar dalam penggunaan pembelajaran bergerak telah dipengaruhi oleh jangkaan prestasi, jangkaan daya-usaha, *self-efficacy*, syarat-syarat fasilitasi, dan pencapaian nilai.

Tambahan pula, kajian ini juga mendapati bahawa jantina telah menyederhanakan perhubungan antara jangkaan prestasi dan niat-tingkahlaku dalam penggunaan pembelajaran bergerak. Cadangan model tersebut telah disokong dan diperjelaskan dengan variasi sebanyak 52.5% dalam niat-tingkahlaku terhadap penggunaan pembelajaran bergerak. Implikasi dan batasan kajian juga telah dibincangkan.

ABSTRACT

With the advancement of Internet technology, more universities in China have put in focus and investment in mobile learning. The benefits of mobile learning will not be maximized unless students use the system. Previous researchers have look at behavioral intention as a measure of success of mobile learning. This study attempts to define mobile learning, examines its characteristics, and describes the current situation of mobile learning in China. Extending the Unified Theory of Acceptance and Use of Technology (UTAUT) model, this study examines the factors (i.e. performance expectancy, effort expectancy, social influence, facilitating conditions, self-efficacy, self-management of learning, attainment value and perceived playfulness) that influence the behavioral intention to use mobile learning by students in Beijing Normal University, China. This study intends to provide insights to assist in strategic decision and planning and thus improve the acceptance and usage effectiveness of mobile learning delivery in Beijing Normal University. A partial-least-squares and Structural Equation Modeling approach was used to evaluate the proposed model. The hypothesized model is validated empirically using data collected from 211 students of School of Management in Beijing Normal University, China. The results suggested students' behavioral intention to use mobile learning is influenced by performance expectancy, effort expectancy, self-efficacy, facilitating conditions and attainment value. In addition, the study found that gender moderates the relationship between performance expectancy and behavioral intention to use mobile learning. The proposed model was supported and explained up to 52.5% of the

variance in behavioral intention to use mobile learning. Implications and limitations were discussed.

CHAPTER 1

INTRODUCTION

1.1 Introduction

This chapter introduces the research outline of the study. It starts with the background of the study, problem statement and followed by research objectives and research questions. This chapter closes with the significant of this research and provides a brief overview of the remaining chapters covered by the thesis.

1.2 Background of the Study

1.2.1 Mobile Learning Definition and Characteristics

From the earliest computer-assisted instruction (CAI) to learner-centered computer-aided learning (CAL), and then the combination of computer and network digital learning with e-learning, the extensive application of science and technology in the field of education sector has received praise by all. In recent years, with the rapid development of mobile computing, a new mode of learning emerged, known as Mobile Learning (m-learning). M-Learning, through the effective integration of mobile technology via the use of mobile phones, PDAs and other mobile devices in learning activities, brings learners anytime and anywhere to enjoy a new learning experience as a future of learning. Mobile learning does not have a precise definition at present, experts in the field give their views, understand and interpret mobile learning from different angles.

Quinn (2000) arrived at the definition: “Mobile learning is through the IA

(Intelligent Apparatus, smart devices) device for digital learning, and these IA devices, including Palms, Windows CE devices and digital cellular phones". Chabra and Flguelredo (2002) combined with the idea of distance education for mobile learning to make a broader definition: "Mobile learning is the ability to use any mobile device, anywhere at any time for the purpose of study". Harris (2001) defined: "Mobile learning is an intersection point with the mobile computer technology and e-learning in the intersection, it can bring experience at anytime and anywhere learning for the learner." While the definition by Dye (2003): "Mobile learning is a kind of learning that can happen under the use of suitable mobile computing equipment to present learning content effectively and to provide teachers and learners a two-way communication at any time and any place".

Compared with other forms of learning, mobile learning has learning convenience, teaching individualization, immediacy, portability, wireless and mobility and other characteristics related scenarios (Yu, 2007). Seppala, Sariola and Kynaslahti (2002) analysed characteristics of mobile learning device such as portability, shape small of equipment, lightweight, easy to carry; wireless, devices without connection; mobility which referring users can use it well in a movement.

The main focus of mobile learning digitized characteristic is mobile communication and networking technologies. As a result of the rapid development of network, it can speed up the step of development learning. Apart from the function of digital learning, mobile learning has unique characteristics in which learning will no longer be limited in front of the computer desk. Learners can get the different way of

learning in anytime and anywhere, as long as they have a mobile device. Similarly, teachers, researchers, and technicians are also available on mobile. Mobile learning can provide learners a relaxed environment, so that they are able to exchange new ideas with others and share their thoughts with others, anytime. The core feature of mobile learning is to allow learners to experience the pleasure of learning, so that learners can learn at the best time and place convenient to them.

1.2.2 Mobile Learning Devices and Technology

Mobile learning is often defined as learning conducted via the use of mobile devices. In general, mobile devices refer to any electronic devices which are small enough to accompany the users in their daily life (Caudill, 2007). The broad categories of mobile devices include PDA (Personal Digital Assistant), smart phones, Pocket PC (Palmtop Computers), Tablet computer, electronic dictionary, MP3/MP4, e-books, and iPod/iPad (Fang, Wang & Huang, 2011).

PDA (Personal Digital Assistant) originally is used in PIM (Personal Information Management) to replace pen and paper and helping people to make some day-to-day management which main features such as structuring the schedule, address book, tasks, and notes. The corresponding products for PDA are called the PocketPC (Windows Mobile operating system) and Palm (products of install Palm OS) (Ma, 2007).

Laptop has been equipment for mobile learning support for many years. In terms of portability, laptop is relatively poor and the battery life is relatively short

which has not been very convenient to support learning as compared to other mobile devices. Even though laptop is the most expensive type of terminal equipment, it has advantages in terms of access, through the network lines connection to the Internet and built-in wireless card. Besides, the data processing power of a laptop is the highest in the all mobile devices and can support computer-assisted learning of systems requiring high complex processing.

Due to low prices, high penetration and easy to carry, mobile phones has become mobile learning emphasis of choice. In the field of education, more mature typical application is the SMS-based mobile learning. This feature is mainly used to build a platform for parents and schools. Schools inform parents on the study situation of their children, test scores, attendance, school updates and short notice through SMS. Parents can express their views and suggestions to schools and head teachers through the same way to understand and grasp their children's learning and living conditions, thus forming a good communication platform between schools, parents and students. Through GPRS, phone users can surf the Web, send and receive e-mail, virtual private networks, visual telephone, multimedia message transfer, etc. The smart phone is based 3G third-generation digital communication technology and has inherited the advantage of the traditional cell phone such as light weight, small size, easy to carry, the unique network support, handles graphics, music, video streaming and other forms of media (Ma, 2007). In addition, smart phone has more memory, better picture and sound processing capability. Therefore, it can access to learning resources, communication as well as possessing outstanding performance in

playing multimedia files.

As discussed above, development of mobile learning need to be supported by related mobile communications, embedded system developing, and wireless network technology. At present the main mobile communication technology is GSM, GPRS, CDMA2000, W-CDMA, TD-SCDMA. With China's 3G technology development and related industrialization process, mobile learning will be more easily and widely accepted by people. Embedded system developing technology is a key technology in the mobile learning intelligent terminal development as it has the advantages of small size, high level of integration, good reliability and portability and hence became the ideal technology for mobile learning intelligent terminal. The wireless local area network (WLAN) is the use of wireless communication technology in certain local scope of established network. It is a product with a combination of wireless communication technology and computer network with wireless multi-access channels as transmission medium to provide the function of the traditional wired LAN in order to enables users really realize optional broadband access at anywhere at any time (Song & Fang, 2007).

1.2.3 Proliferation and Perfection of Mobile Learning Tools

The penetration rate for mobile learning tools has increased (Yang, 2009). Today, the number of mobile phone holders has reached 988 million in China. Mobile Internet users accounted for 485 million Internet users in China by the end of June 2011 (The Economist Online, 2012). Most of the manufacturers began to pursue videos, Web

site visit, reading e-books, online chat and other functions in one portable equipment to satisfy people's increasingly rich demands. In distance education, it is not the technology itself that has the teaching characteristics to make distance education possible, but the technology must be made relatively common and owned by the public. Currently in the market, smart phones and mobile phone display are sufficient to cater for the needs of mobile learning. Moreover, the rapid development of operating system, high-capacity storage devices and price reduction has provided an assurance for the success of mobile learning. In summary, mobile devices are convenient, lightweight physical characteristics, it makes learning possible anytime and anywhere.

1.2.4 The Rapid growth Growth of Mobile Learning

It is generally believed that mobile learning is the essential mode of learning in the future. In pursuing life-long education, mobile learning has become an important force in building "ubiquitous learning". Leading universities around the world have launched various models of mobile learning research projects, and has made a breakthrough in the mobile learning software development, platform design, website construction and effect of other fields. Governments have seen the importance of mobile learning towards life-long learning and have proposed the construction of "ubiquitous networks", or the "U" program, such as U-Korea, U-Japan and the U-Taiwan (Wang & Hu. 2008).

Mobile learning is not only education and technology but also is a key topic of

the whole society. Therefore, mobile learning has a high social value (Yu, 2007). In Canada, the first short experiment took place in 2001, conducted at the Northern Alberta Institute of Technology and using PDAs. Since then, different universities have been experimenting with pod-casting of lectures. Athabasca University, which hosted the International Mobile Learning Conference in 2006, is leading in mobile learning research where it has created a mobile-enabled digital reading room with materials accessible using a variety of different mobile devices. The Republic of Korea is in the forefront in Asia and in the world in adopting new technology for learning. For instance, it has been far ahead of Japan in introducing broadband access in the homes (Li & Xiang, 2004). There are examples of mobile learning activities on all educational levels (Li & Xiang, 2004). The Ministry of Education has included mobile learning as one section of the nation-wide educational software context. Korean universities encourage the development of Internet learning that uses mobile technology (Cheong, & Park, 2005).

1.2.5 Oversea Research and Results of Mobile Learning

At present, foreign research of mobile learning mainly focus on Europe and North America and some of the developing countries since the last 2 - 3 years. The research purpose can be broadly divided into two categories, one is initiated by the current e-learning provider to learn from the experience of e-learning, put mobile learning into the market with emphasis of uses in the enterprise training; another one is initiated by the educational institutions which is based on school education in attempt

to improve teaching, learning and management via the new technology.

Mobile learning research started from a cognitive and instructional perspective that examines the feasibility of the mobile devices that were used in the actual teaching and learning (Waycott et al, 2002). During the experiment, learners showed strong curiosity and excitement on the use of new technologies and they are very willing and eager to use this new technology in learning. As a result, the effect of learning have been significantly improved under the new technology-assisted which provides a good prerequisite for further research and applications for mobile learning.

Nevertheless, there are still some researchers who are skeptical about the use of mobile devices, according to Liang and Li (2010), PDA, WAP (wireless application protocol) mobile phones and other mobile devices are just an extension of the learning tool, these tools cannot replace the existing learning tool. Most importantly, not all of the learning content and learning activities are suitable for the use of mobile devices.

The most direct application form of mobile learning is that it allows the learners to realize digital learning through mobile devices. In mobile learning project at the University of Helsinki in Finland, researchers try to apply WAP technology to higher education with the intention to create a workable mobile learning environment for learners and teachers, so that learners and teachers through WAP mobile phone or smart phone access to the teaching and learning resources at anytime and anywhere (Sariola, Sampson, Vuorinen & Kynäslähti, 2001).

“M-learning” is a mobile learning program funded by the European Union. The

research plan is undertaken by the five organizations of the United Kingdom, Sweden and Italy, which lasted three years, the project's objectives is to create a mobile learning environment through the use of a variety of mobile communications for some people of unfinished education have to leave school and the same time to develop appropriate mobile learning resources, including a variety of courses, services and products (Collett & Stead, 2002).

Stanford University Learning Lab (SLL) started from language learning to develop a mobile learning module for foreign language learning which include words training, tests, words and phrase translation training. In addition, there are many other programs are still under research. According to the different needs of learners, researchers have developed apply to PDA and WAP mobile phone content, learning tools and other applications (Stanford Academic Community, 2001)

As a way of communication, short message service (SMS) has been widely used. Because of its widespread popularity of use, some researchers began to try adopting it in teaching and learning. In University of Helsinki in Finland, short message service was used in teacher training and has obtained satisfactory preliminary experimental results. The University plans to put MMS (Multimedia Messaging Service) technology used in education and teaching in the next research, through the mobile equipment of digital image generation and transmission (Seppala, Sariola & Kynaslahti, 2002). Short message service as a teaching aid not only for the learners everyday communication, but also can be used for the academic information, schedules, and important notices and so on. This service can have more excellent

performance than e-mail and web in certain environment flexibility.

WAP (wireless application protocol) education site construction is another important aspect in the research field of mobile learning. British' Ultra lab through analysis of the 16-24 year-old European young people's learning characteristics, developed and set up WAP education site of mobile learning. This is because the WAP education site on play a crucial role for mobile learning and many universities in the past few years have been established own WAP education site, such as the United States' Griffith University and Canada' NAIT etc (Virtanen, John & Wright, 2002).

University of Birmingham try to move the technology and equipment used in life-long learning based on the development of future education and learners lifelong needs. They believe that the only access knowledge and skills through school education is not enough, in order to adapt to the society of rapid change and development in the future, people must continue learn new knowledge and skills in daily life and work. They viewed that future studying should be get rid of the control of time and space, people can learn anytime, anywhere based on actual demand. Hence, they carry through handler the mobile learning project that called HandLeR, this project plan to develop mobile learning resources for people of the different ages with different actual needs (Sharples, Corlett & Westmancott, 2002).

The University of Oslo in Norway proceeded "Know-mobile" research project, the project' purpose is support medical student to conduct Problem-Based Learning. Medical students often need leave the campus to the hospital for professional

practice and this mobile device can be a great aid to help them to solve the problem in practice process (Smordal, Gregory & Langseth, 2002).

1.2.6 China Mobile Learning Research Status

In 2000, Desmond Keegan in his report entitled "made from the e-learning to m-learning" introduced the concept of mobile learning to China, according to the different states such as the actual situation of the funds, technology and economy. China's research has not achieved greater progress. The research work mainly concentrated in the Eastern region and several well-known Universities, and only limited to the construction of the wireless local area network but did not initiate the teaching model to build the research experiment.

In May 2002, the campus of Peking University started the first wireless local area network-building project, which opened the prelude of domestic wireless network on campus. In August 2003, Peking University's first phase wireless LAN deployment was completed. The teachers and students inserted the wireless card in their laptop and installed the relevant drivers to access rich information in the school library. In September 2004, Intel joined with China education and research network (CERNET) and announced the launch of "China Wireless University Plans" to promote mobile computing and wireless technologies use among 100 universities in China. The first step of the project was deployment of infrastructure among the universities include the Tsinghua University, Beijing Second Foreign Language University, Fudan University, Shanghai Jiaotong University and so on (Wang & Hu.

2008).

In the University of China Wireless Summit held in September 2005, Peking University, Hong Kong University and Taiwan University were selected as the three representative universities to develop wireless campus network. In July 2006, the first mobile learning thematic website: <http://www.mlearning.org.cn> was launched. In June 2008, the first mobile learning monograph was published by Professor Huang Ronghuai on "Mobile learning – Theory, Status, Trend ". In July 2008, China has its first 3G campus network. China's first mobile education industry development forum was held in 2009 (Wang & Hu. 2008). Mobile learning has started to develop only for a short decade in China, but it has made considerable progress.

1.2.7 Mobile Learning Trend in China

Many researchers and educators view mobile learning as the immediate descendant of e-learning, i.e. mobile learning is closely related to e-learning (Cavus & Ibrahim, 2009).

Some researchers argued that mobile learning originated from e-learning (Shrivastava, Yadav, & Shrivastava. 2005). E-learning entered China at the end of the last century has been used as a special form of education along with the development of web-based education popularity in the country. E-learning was mainly used for evaluation purposes in the area of counseling, academic education and professional certifications in China, such as online high school and the distance education of universities. The usage of e-learning has also been adopted in various cases of

enterprise training. (Sun, Liu & Han, 2010).

By the end of January 2012, Chinese mobile phone users had reached 988 million and 997 million in late February. On 3rd March 2012, China is set to reach 1 billion mobile phone subscriptions. Chinese mobile phone users accounted for more than 15 percent of the world (The Economist Online, 2012).

By the end of June 2011, there is a total of 485 million Internet users in China, its Internet popularizing rate is 36.2% which shown an improvement of 1.9% compared to 2010 year's end. By the end of December 2011, the Internet users have exceeded 500 million in China. Internet penetration rate promoted 4 percentage points compared to 2010. The number of mobile phone users continued to steadily expand, up to 318 million, compared with 2010. (CNNIC , 2011).

In the first half of 2011, 74.0 % of Internet users use a desktop computer to the Internet, users of mobile phones and laptops are 65.5% and 46.2%. Compared to the end of 2010, the proportion of the Internet using desktop computers in Internet users has reduced 4.4%, and the proportion of the Internet using cell phones and laptop computers have a lower-increase and application depth of mobile Internet generally improved. In terms of users of mobile Internet applications, mobile instant messaging is still the highest utilization rate applications (71.8%). (China Internet Network Information Center CNNIC, 2011). Of all these users, 26% are between 10-19 years old, 30.8% between 20-29 years old, 23.2% between 30-39 years old, 11.6% between 40-49 years old, 4.8% between 50-59 years old, 1.3% under 10 years old, and 2.4% above 60 years old. The majority of these users are senior school

graduates (33.9%) whose ages range from 15 to 17 and junior school graduates (35.1%) whose ages vary between 12 and 14. 6.1% are under elementary school and 11.7% are above bachelors (CNNIC, 2011).

These statistics results show that educating Chinese population via mobile learning has great potential in China, as mobile learning may help to provide a more equal access and brighter opportunities for all people regardless of races, colors, ages and living places. Since November 2011, mobile and telecommunication users in Beijing's Xidan, Wangfujing (the Olympic central area), the three major railway station, Financial Street, Zhongguancun Street, seven Beijing landmark areas, users are able to use mobile phones, tablet PCs, laptop wireless Internet access at no cost. Wireless Internet and Wifi signal coverage for the development of mobile learning provide a necessary condition (Tao, 2011).

According to the 2010-2011 China Mobile Internet Terminal Marketing Research Annual Report in the field of mobile Internet, educational and other non-entertainment applications will become more and more mainstream. China Mobile Learning Advisory Network founder Li Senlin in the field of mobile learning has been committing to developing mobile learning platform and tools. At present, the software technology environment has had the conditions to do the mobile learning platform (Lu, 2006).

The popularity of tablet PCs has encouraged a more feasible environment for mobile learning in China. Currently, the Government has been putting attention for mobile learning projects, but mainly driven by research institutions and related

businesses promotions. On 1st November 2010, the Portal "NetEase" was launched which include video open class project for the global elite Universities. Users can watch online video of quality courses from Harvard, Yale, Oxford, Cambridge and other British and American top well-known Universities for free. NetEase open class platform has been put on mobile terminal and on February 2011 it has become official online access for iPad version and in only a day's time it was listed in the first ranking in Apple App Store Chinese free application software (Tao, 2011). This has demonstrated the passion and needs of mobile users in China.

1.2.8 Background of the Beijing Normal University

Beijing Normal University is a renowned institution of higher learning that it has hundred year history, teaching and research force living in the first-class in China. Its predecessor is the Capital Normal School which was founded in 1902. In 1923, the name was changed to Beijing Normal University, being the first Normal University in Chinese history. After more than a century of hard struggle, Beijing Normal University, with its glorious history, the strength of a strong, eye-catching achievements, unique and innovative spirit in domestic to won a high reputation and in the international community. The total area of Beijing Normal University covers 172.6 acres, and it has over 3,000 faculty and 21,000 full-time students, including 8,700 undergraduates, 10,000 postgraduates, and 1,800 long-term international students. The campus has one education faculty, 22 schools and colleges, 2 departments, and 24 research institutes (centers). The library boasts over 3.88 million

volumes and some 100,000 GB of digital resources.

The comprehensive disciplinary strength of Beijing Normal University puts the University at the forefront of the nation's advanced teaching institutions. The university offers 57 different undergraduate majors, 162 Master's degree programs, 100 Ph.D. programs, 18 different rotating post-doctoral posts, and 16 primary subjects Ph.D. and Master's degree programs. According to the assessment results of primary subjects in 2009 as issued by the Ministry of Education Academic Degree Center, the three primary subject, education, psychology, and Chinese language and literature are ranked first, and 15 other subjects ranked among the top ten in China. In the 2011 World University Rankings published by the UK Higher Education Survey, The University is ranked 64th among the Asian universities, ranked 8th among the colleges and universities on the Mainland China.

In 1999, the University set up a Network education exploratory committee to carry out the preparatory work of the Network Education College. In July 2000, Beijing Normal University was approved by the Ministry of Education to conduct modern distance education of pilot projects. The Network education in Beijing Normal University first opening ceremony was held on March 10, 2001. In order to promote educational innovation, in April 2004, the University established the School of Continuing Education and Teacher Training. After more than four years of exploration and practice, until November 2004, the School online education has shown success in the establishment of 76 off-campus learning centers. By July 2011, the School's online education has more than 30,000 students.

1.3 Problem Statement

Mobile learning research in China is still in its infancy stage. There exists many imperfections, but mobile learning as an extension of educational services, has expanded the scope of education, met the personalized learning needs, realized learning and communication at any time and place. For researchers, the main critical issue is to examine factors that influence the adoption of mobile learning among the potential users, thus creating new learning environment to meet the learning needs of individuals and society as a whole. Currently, there is a scarcity of actual survey data and input from users in China regarding mobile learning adoption. Most of the studies found in China are summaries of research conducted in other countries. Hence, this situation has created a gap following the popularization of mobile learning devices and mobile networks. In order to study the adoption of mobile learning in depth and to find the right way to impart mobile devices into teaching and learning, it is important to examine the current usage of mobile learning, to understand users' needs and expectation, as well as to discover the problems in adoption and usage.

The institutions of higher learning in China lack academic research initiative and effective mechanism in mobile learning, as well as the dedicated intra- and inter- universities mobile learning research team. As an advanced and dominant force in scientific educational research, universities play a crucial role in the application and popularization of mobile learning. Mobile learning development requires conducive learning environment support from the university, including

mobile learning systems, human resources and learning resources. Therefore, creating a good learning environment is a precondition for mobile learning to work and gained widespread adoption by the potential users.

Mobile learning is a very personalized form of learning, as such, research on mobile learning is different for different groups of users (Yang & Wang, 2011). Undergraduate and postgraduate students are the groups of individuals who has potential high rate of mobile devices usage. This group is also known for its faster acceptance of new things, which makes mobile learning important for this target group. Through these devices, they can connect to the Internet, upload and download files, and share their knowledge with others. However, the current mobile learning research is still relatively absent in discovering the factors that could influence their behavioral intention to use mobile devices for learning. Most students in China are still relatively weak on the concept of mobile learning, and they do not know how to better use their mobile devices and mobile networks for purpose of learning. The factors that encourage them to adopt mobile learning are still unknown at the moment. Therefore, this study aimed to examine factors that influencing users behavioral intention to use mobile learning among undergraduate learners in Beijing Normal University, Beijing, China. These factors are performance expectancy, effort expectancy, social influence, self-efficacy, facilitating condition, self-management of learning, attainment value, and perceived playfulness, behavioral intention to use mobile learning, and the moderating variable is gender.

1.4 Research Questions

To understand the problem statement, this study attempt to address the following research questions as shown in Table 1.1.

Table 1.1 *Research Questions*

Research Questions	
a)	Does performance expectancy influence learner's behavioral intention to use mobile learning?
b)	Does effort expectancy influence learner's behavioral intention to use mobile learning?
c)	Does social influence influence learner's behavioral intention to use mobile learning?
d)	Does facilitating conditions influence learner's behavioral intention to use mobile learning?
e)	Does self-efficacy influence learner's behavioral intention to use mobile learning?
f)	Does self-management of learning influence learner's behavioral intention to use mobile learning?
g)	Does attainment value influence learner's behavioral intention to use mobile learning?
h)	Does perceived playfulness influence learner's behavioral intention to use mobile learning?
i)	Does gender moderates the relationship between performance expectancy and learner's behavioral intention to use mobile learning?
j)	Does gender moderates the relationship between effort expectancy and learner's behavioral intention to use mobile learning?
k)	Does gender moderates the relationship between social influence and learner's behavioral intention to use mobile learning?

1.5 Research Objectives

This research aims to enhance understanding of factors influencing learners' behavioral intention to use mobile learning in Beijing Normal University, China. The research also examined the applicability of an extended UTAUT to mobile learning as a new innovation for learning tool in a Chinese university education system.

Specifically, the objectives of this research are as follows:

- a) To investigate the relationship between performance expectancy and learner's behavioral intention to use mobile learning.
- b) To investigate the relationship between effort expectancy and learner's behavioral intention to use mobile learning.
- c) To investigate the relationship between social influence and learner's behavioral intention to use mobile learning.
- d) To investigate the relationship between facilitating conditions and learner's behavioral intention to use mobile learning.
- e) To investigate the relationship between self-efficacy and learner's behavioral intention to use mobile learning.
- f) To investigate the relationship between self-management of learning and learner's behavioral intention to use mobile learning.
- g) To investigate the relationship between attainment value and learner's behavioral intention to use mobile learning.
- h) To investigate the relationship between perceived playfulness and

learner's behavioral intention to use mobile learning.

i) To examine the moderating effect of gender on performance expectancy and learner's behavioral intention to use mobile learning.

j) To examine the moderating effect of gender on effort expectancy and learner's behavioral intention to use mobile learning.

k) To examine the moderating effect of gender on social influence and learner's behavioral intention to use mobile learning.

1.6 Significance of Study

1.6.1 Theoretical significance

Through this research, the Unified Theory of Acceptance and Use of Technology (UTAUT) by Venkatesh et al. (2003) was adapted and extended in a Chinese university setting. Specifically, the adoption of mobile learning among university students is examined by looking at factors including self-efficacy, effort expectancy, performance expectancy, social influence, facilitating conditions, self-management of learning, attainment value, perceived enjoyment, as well as moderator of gender to the behavioral intention to use mobile learning among undergraduate students in Beijing Normal University, China.

1.6.2 Practical Significance

Mobile learning is the use of digital mobile devices (such as mobile phones, etc.) to learn at any time and any place; it is an extension of e-learning. Mobile learning do

not need to have fixed space and specific time according to learners' need to learn at anytime, anywhere and fully meets the learners' personal learning needs. It can also enrich teacher's teaching method. As students have a wide variety of mobile devices with more free time, the autonomy of the students' learning became stronger. Thus, mobile learning as a secondary form of traditional teaching in universities has become feasible and meaningful.

Mobile learning is relatively new in China and there is a scarcity of research and applications in the area. As for introduction of new technology to potential users, the key question is how well the technology will be accepted by the users. Hence, this study, through survey data analysis, came in time to find out the determinants of the behavioral intention to use mobile learning among undergraduate students in Beijing Normal University (BNU), China.

The findings on the current state of mobile learning inclination among the undergraduate students in BNU in China, provides a better picture on the status of readiness in adopting mobile learning. In addition, this study attempts to uncover the various factors which affect the learner's adoption of mobile learning. From the results of this study, recommendations on enhancing mobile learning behavioral intention to use among learners in China are proposed. This is aimed at promoting lifelong learning and social learning in depth and improving the efficiency of mobile learning.

This study provides significant insights about mobile learning from the users' perspective. It will help guide practices on how to encourage mobile learning

adoption, improve the mobile learning environment and develop better learning applications, particularly in a Chinese university setting. One of the outcomes of this study is towards sustainable distance education through mobile learning. Mobile learning appropriates the self-motivation and impulse of learners in providing sustainable distance education to social groups of students in BNU, China.

1.7 Definition of Terms

There are total of eight variables examined in this study. Constructs and definitions of these variables are shown in Table 1.2 below.

Table 1.2 *Constructs and Definition of Terms*

Constructs	Definition	Source
Performance Expectancy (PE)	Performance expectancy refers to the "degree to which an individual believes that using a particular system will help him or her to attain gains in job performance".	Venkatesh et al.(2003)
Effort Expectancy (EE)	Effort expectancy is the "degree of ease associated with the use of the information system".	Venkatesh et al. (2003)
Social Influence (SI)	Social influence is the "extent to which a person perceives that it is important others believe he or she should use a new information system".	Venkatesh et al. (2003)

Facilitating Conditions (FC)	Facilitating condition refers to the "degree in which an individual believes that an organizational and technical infrastructure exists to support use of the system".	Venkatesh, et al. (2003)
Self-efficacy (SE)	Self-efficacy refers to a "user's self confidence in his or her ability to carry out tasks across multiple computer application domains".	Perea et al. (2004)
Self-management of Learning (SL)	Self-management of learning refers to the "extent to which an individual perceives he or she is self-disciplined and enables to engage in autonomous learning".	Smith et al. (2003)
Attainment Value (AV)	Attainment value is "personal importance of doing well with regard to self-schema and core personal values".	Eccles et al. (1983)
Perceived Playfulness (PP)	Perceived playfulness/enjoyment is the "extent to which an activity is perceived to be enjoyable in its own right, apart from any performance consequences that may be anticipated".	Davis et al. (1992).