THE EFFECTS OF SMS-BASED LEARNING TOWARDS UNDERGRADUATES' MOTIVATION AND PERFORMANCE

by

MAHALECUMY D/O NARAYANANSAMY

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LIST OF ABBREVIATIONS

SMS	Short Message Service
TBL	Technology-based learning
PDA	Personal digital assistants
LMS	Learning Management System
ILT	Instructor-led training
MCMC	Malaysian Communication and Multimedia Commission
M-Learning	Mobile learning
ID	Instructional Design
MIT	Malaysian Information Technology
ICT	Information & Communication technology
IMMS	Instructional Material Motivational Survey
ARCS	Attention, Relevance, Confidence and Satisfaction
SPSS	Statistical Packages for Social Sciences
USM	Universiti Sains Malaysia
MOSAD	Mobile System Analysis and Design
TXT-2-LRN	Text-to-learn
EFL	English as a Foreign Language
MOLT	Mobile Learning Tool
EMME	Eye Movement Modelling Examples
CAULS	Context-Aware Ubiquitous Learning System

KEBERKESANAN PEMBELAJARAN BERASASKAN SMS TERHADAP MOTIVASI DAN PENCAPAIAN PELAJAR

ABSTRAK

Ciri-ciri unik telefon bimbit ialah fleksibiliti dan kebolehpercayaan SMS. Ini telah memperkenalkan pedagogi inovasi baru dalam sistem pembelajaran yang sedia ada. Reka bentuk pengajaran (ID) memainkan peranan penting dalam proses pengajaran dan pembelajaran. Kajian ini menyiasat keberkesanan ID berdasarkan kajian oleh Park (2011) iaitu rangka kerja pedagogi yang diubahsuai pada "mobile learning" (m-pembelajaran) terhadap motivasi pelajar sepenuh masa Pengurusan. Kajian ini telah dijalankan di kalangan 80 orang pelajar sepenuh masa dari Pusat Pengajian Pengurusan, Universiti Sains Malaysia. Pelajar-pelajar telah dibahagikan kepada dua kumpulan iaitu kumpulan kawalan dan kumpulan eksperimen. Analisis kuantitatif telah digunakan untuk mengenal pasti jika wujud perbezaan yang ketara terhadap pencapaian dan motivasi pelajar. Park (2011), "Modified Pedagogical Framework of Mobile Learning" telah luas diaplikasikan untuk rekabentuk dan pembangunan kandungan kursus. Tambahan pula, Keller (1983) "ARCS Model" telah diaplikasikan untuk mengkaji tahap motivasi pelajar terhadap pembelajaran berasaskan SMS. Kaji selidik Motivasi Bahan Pengajaran (IMMS) telah digunakan untuk mengumpul data. Sampel berpasangan ujian-t telah dijalankan untuk meneliti jika ada wujud perbezaan yang ketara terhadap motivasi pelajar antara soalselidik pra dan pasca. Hasil kajian menunjukkan bahawa terdapat perbezaan yang signifikan antara skor min motivasi pelajar terhadap soalselidik pra dan pasca. Tambahan pula, telah wujudnya hubungan yang signifikan antara pembolehubah motivasi iaitu perhatian (attention), kerelevenan (relevance), keyakinan (confidence) dan kepuasan (satisfaction). Ringkasnya, rekabentuk dan pembangunan kandungan pembelajaran berasaskan model Park (2011) "Modified Pedagogical Framework of Mobile

Learning" telah memberikan impak yang positif terhadap pelajar m-pembelajaran bagi pencapaian dan motivasi dalam pembelajaran.

THE EFFECTS OF SMS-BASED LEARNING TOWARDS UNDERGRADUATES' MOTIVATION AND PERFORMANCE

ABSTRACT

The unique features of mobile phones, the flexibility and reliability of SMS introduced a new pedagogical innovation in the existing learning system. Instructional design (ID) plays a crucial role in teaching and learning process. This study investigated the effectiveness of ID based on Park's (2011) modified pedagogical framework of mobile learning towards full time Management students' motivation. This study was conducted among 80 full time students from School of Management, Universiti Sains Malaysia. The students were divided into two groups that were the control group and the experimental group. A quantitative analysis was used to identify if there were any significant difference on students' achievement and motivation. Park's (2011) "Modified Pedagogical Framework of Mobile Learning" was widely applied to design and develop the course content. Furthermore, Keller's (1983) ARCS model has been applied to evaluate students' motivation towards the implementation of SMS-based learning. Instructional Material Motivational Survey (IMMS) was used to collect the data. A paired sample t-test was carried out to scrutinize if there was any significant difference on students' motivation between pre and post questionnaire. The findings illustrated that, there were significant difference between the mean scores of students' motivation of pre and post questionnaire. In addition, there were significant relationships between the motivation factors attention, relevance, confidence and satisfaction. Briefly, the designed and developed SMS-based learning contents based on Park's (2011) "Modified Pedagogical Framework of Mobile Learning" gave positive impact on students' achievement and motivation in learning.

CHAPTER ONE

INTRODUCTION

1.1 INTRODUCTION

According to Thomas (2010), instructional design is an organised enhancement of instructional specifications using learning instructional theory. This is to ensure the quality of instruction. It is a whole process of investigation of learning needs and goals and also the development of a delivery system to meet those requirements. Instructional design enables learning to be more effective, efficient and most importantly, engaging. It plays a vital role in teaching (pedagogically) and the learning process (andragogically) to disseminate the contents successfully (Cercone, 2008).

It is believed that, a well- designed learning content and teaching approach will lead to effective teaching and learning. According to Gage and Berliner (1998), to stimulate and sustain student learning behaviour motivation has been identified as the essential component. Moreover, motivation has a salient effect in learning process. It is advocated that, the higher the motivation level, the better the students will perform in various instructional settings (Sankaran & Bui, 2001).

The aim of this research is to examine the application of Short Message Service (SMS) based learning on students' achievement and motivation. The students' achievement level plays a crucial role in this research as a moderating variable between instructional design and the students' motivation. This research employs the experimental design to investigate the effects of instructional design and students' motivation.

This introductory chapter outlines the overview, the direction of the study, research background, objectives and research question.

1.2 RESEARCH BACKGROUND

Technology-based learning (TBL) system was widely introduced in the 21st century to enhance learning (Koller et al., 2008). Computing and communication technologies are broadly applied in the education field through multimedia and technology, such as the Internet, digital programs and systems, personal digital assistants (PDA), and games, to assist in the learning process. These technologies have resulted in "blended learning" and in further development and technological innovations being beneficial (Alam & McLoughlin, 2010). In the 21st Century, TBL has been increasingly important.

According to Yengina et al. (2010), TBL occurs with newly developed devices or concepts, such as personalized and adaptive e-learning, portfolio collections, and more advanced online mind tools. Clark and Mayer (2008) stated that social networking tools, such as Wiki, YouTube, Twitter, or Facebook, might be used as an integral component in technology based learning. In an effort to implement e-learning, a software known as Learning Management System (LMS) has been used to administrate the teaching and learning processes.

LMS is one of the first innovations in the e-learning concept (Mayhoub & Muhammad, 2013). The first LMS offered off-the-shelf platforms for front-end registration and course cataloging and tracked skills management and reporting on the back-end (Clark, 2002). Kiffmeyer (2004) stated that instructor-led training (ILT) via the Web combined with real-time mentoring had improved learner services.

Furthermore Waight et al. (2004), who interpreted reports on e-learning published by the government, businesses, and associations in the United States from 1999 to 2003, advocated that LMS is for lifelong learning and demanded improvements in technology because of the existence of a high level of skilled workers, pervasiveness of computers, globalization, new ways of learning from new technologies, and the improvement of the learning quality via technology. In noting that, Moyle (2010) advises that the ‘ubiquity of technologies and the robustness of young people’s abilities

to communicate and collaborate presents challenges for educators and stakeholders about how students use technologies for learning and communicating with each other.

However Fichten et al. (2000) clarified that students had encountered different disabilities in the use of ICT such as accessibility, inflexible time limits, technical difficulties and problems in downloading the files. This statement was supported by Bissonnette (2006). He stated that, "the implementation of e-learning in post-secondary institutions failed to think about the needs of students' disabilities and the accessibility of the e-learning".

The changes in lifestyles and the advances of ICT have influenced education systems as well. Mobile technologies/wireless technology and innovations, particularly mobile phones, combined both ubiquity and utility to offer greater opportunity for communication and computation. These advantages give great opportunities to employ mobile technologies widely, especially in education, than merely being communication tools.

Based on a study conducted by the Malaysian Communication and Multimedia Commission (MCMC), the penetration rate for cellular phones in Malaysia in the first quarter of 2011 was 121 per 100 inhabitants. Multiple subscriptions of cellular phones caused a 100% penetration rate.

Mobile devices, especially phones, play a vital role in every student's life. The unique features of mobile phones offer a great opportunity to the learning. The flexibility and reliability of SMS as a communication tool has enabled its use as a learning tool. SMS-based learning systems can be conducted with any ordinary mobile phone. Unfortunately, not all students are able to own expensive models or PDAs. Certain educational establishments deliver course contents to students via SMS, which is also known to be a mode of interactive teaching tool, whereby the messages are in a push and pull mode.

Mobile learning (m-learning) is a potential learning mechanism (Gomez et al., 2014). First, mobile learning (m-learning) is ubiquitous, as it is available anytime and anywhere. Trinder (2008) supported this claim, with greater emphasis on mobile devices and the universal free access to high-speed network from anywhere within the campus.

Second, mobile learning (m-learning) is flexible. Course contents can be delivered anytime. According to Chan (2006), "seamless learning" indicating that students can learn in a variety of scenarios whenever they are in a learning mood.

Third, m-learning is affordable. SMS is supported by all types of mobile phone. According to Roschelle (2003), technology has progressed extremely and uniquely well, and this affordability results in changes in education. Therefore, future research should

give more attention towards the integration of the technology in learning (Roschelle, 2003). Moreover, SMS-based learning is faster and more affordable as it does not rely on an Internet connection. SMS-based learning allows for low-cost implementation of real-time and text-based interaction (Markett, 2006).

Finally, Short Message Service based learning (SMS-based learning) requires simple mobile technology, and the learning process becomes more enjoyable. Furthermore, m-learning provides the opportunity for learners to vary their study location and to study "on the move," which enables them to study while travelling (Evans, 2008). He indicated that the usage of portable technologies makes the convenient transmitting of teaching and learning materials more simple for learners and educators. Furthermore, he added that because learners normally have their devices with them, the devices also assist learners in "just-in-time" learning and students can utilise their uncommitted time to studying and doing revisions.

E-learning requires an Internet connection and access to a computer, but SMS-based learning does not require either and is accessible to students anytime and anywhere they want. However, to assist students in their day-to-day learning, effective instructional design needs to be meaningfully developed to aid in effective acquisition and learning.

According to Chen (2012), the key factor in determining the effectiveness of an instructional material is not only based on the level of contextualization, but the type of design and implementation. In the teaching and learning approach, instructional design is a very important factor that needs to be considered because an effective instructional design enables efficient dissemination of learning content, resulting in better understanding and meaningful learning. In addition, each student has different learning preferences and individual interests (Anderson, 2007). Therefore, more emphasis should be given on motivation and learning strategies to reach students via effective instructional approaches.

Although many studies on SMS-based learning have been carried out, investigating whether the instructional design of SMS-based learning is truly effective in reaching out to students and affects their motivation is imperative. Additionally, an interactive instructional design will bring the realism in learning by influencing the students' motivation towards learning (Botturi, 2003).

1.3 RESEARCH PROBLEM

Existing research has found certain disadvantages in traditional teaching or conventional teaching. According to Attewell and Gustafson (2002), in traditional classrooms students focus and pay attention to lectures only at the beginning of the session for approximately 20 minutes before they start losing focus or becoming distracted. As a result, many young adults are not willing to continue to higher education

for fear of experiencing the same situation and eventually losing their interest and enthusiasm toward education (Attewell & Gustafson, 2002).

A student-centered teaching method would be appropriate at higher education levels, because students are more mature and bring diverse ethnic experiences that can be activated and applied to engage them in learning and in the construction of knowledge (Conner, 2004). However, in the rush to integrate technology into teaching (in the implementation of e-learning), the accessibility needs of students with various disabilities was not considered (Bissonnette, 2006).

Melicherikova and Busikova (2012) stated that the lack of personal contact in e-learning has caused low motivation and that students were not given suitable tasks such as not well designed learning contents and a lack of practice. Both teachers and students need training to acquire basic ICT competency that would allow them to use computers. Otherwise, students may feel frustrated and may become demotivated instead of being motivated to learn and teachers may refuse to use a technology. This can be due to some technical problems referring to the fact that computers, due to their limitations of their artificial intelligence, computer technology is unable to handle unexpected situations as teachers can (Dina & Ciornei, 2013). Furthermore, innovative forms of teaching and learning, such as the Web and other educational multimedia are consequently not always well understood by the learners (Ohl, 2001). Cook (2007) further argued that many WBL instructional designs fail to incorporate principles of effective learning.

Fichten et al. (2009) discussed the problems with e-learning. The study examined problems with the accessibility of websites and course/learning management systems (CMS/LMS), the accessibility of digital audio and video, inflexible time limits built into online exams, PowerPoint/data projection during lectures, course materials in PDF, and the lack of needed adaptive technologies. The results of the study showed that students faced technical difficulties in e-learning, such as connecting to websites and CMS, problems in downloading and opening files, web pages that would not load, video clips taking too long to download, poor use of e-learning by professors, students' own lack of knowledge working with e-learning, and poor accessibility of course notes and materials in many formats. Therefore, the application of new technologies in teaching needs further consideration on application of theories, such as perception, learning, communication, and systems in design, and evaluate the effectiveness of the instructional media (Lohr, 2011).

SMS-learning may be applied as an extension to the existing learning mechanism, provided that the system must be usable and useful to gain acceptance from its users (Issham et al., 2010a). The m-learning group of USM has conducted a few studies on mobile learning to identify students' perceptions and acceptance of the application of mobile as a tool for teaching and learning process. However, the potential role of an interactive and effective Instructional Design (ID) on SMS-based learning has been ignored in the literature (Sarah, 2011). As asserted by Sarah (2011), an in-depth investigation of the SMS-learning instructional design is required to find the more effective design for teaching and learning. According to Lavoie (2006), it is essential to identify the user's needs in developing a mobile learning system. Furthermore, Lee and

Lee (2005) stated that there are many m-learning researches failed to meet the user's expectations.

SMS-based learning does not require computers, internet service and information technology. Therefore, students can study anytime and anywhere they want which overcomes the constrain of conventional teaching. This is because, in conventional teaching students need to carry around their books or short notes to study but in SMS-based learning the important notes will be disseminated ubiquitously. Eventually, this will increase enrollment of the students. According to Janet (2011), the innovative use of combining andragogy (strategies of teaching) and texting (SMS) could provide a new andragogically based instructional methodology for higher education that was previously vacant. Briefly, a well-designed SMS-based learning content could assist the students in their learning.

Therefore, the aims of this study are to fill the existing research gap in SMS-based learning. Previous studies on m-learning, which included SMS-based learning, are limited only to the technological aspect, and studies conducted in SMS-based learning are lacking. Therefore, further research must be conducted to investigate the instructional design, which affects users' motivation to learn, and to fill the gaps in SMS-based learning.

1.4 RESEARCH OBJECTIVES

According to Baylor and Kim (2003), an important aspect of designing interactive learning content for multimedia instructions is to carefully plan their roles within the learning environment to serve the intended educational purposes. Consequently, the aim of this study is to examine the influence of SMS-based learning on students' achievement and motivation. This research aims to achieve the following:

1. To examine students' achievement in using SMS-based learning content based on Park's (2011) modified pedagogical framework of mobile learning.
2. To study students' motivation for using SMS-based learning according to the ARCS motivation model.

1.5 RESEARCH QUESTIONS

The concept of Information & Communication technology (ICT) comes as a part of the Malaysian Information Technology (MIT) agenda that encourages all field players starting from students, teachers, administrators and parents to utilize IT in every aspect of education at the administrative and classroom levels (Waleed, 2011). Dickinger et al. (2005) stated that mobile phones, personal digital assistants (PDA), and laptops are equipped with built-in wireless and these encourage learners to access the information network anywhere. Although mobile learning seems to be innovative and interesting to students, their learning performance could be disappointing without proper learning

strategies or tools (Chu et al., 2010; Hwang et al., 2010). In undertaking this study, the following research questions were put forward:-

1. Is there any significant difference between the post-test scores of an experimental group students and control group students?
2. Is there any significant difference in an experimental group students' motivation after the implementation of the study?
3. Is there any significant relationship between attention, relevance, confidence and satisfaction?

1.6 RESEARCH HYPOTHESES

The purpose of this study is to investigate the influence of instructional design on SMS-based learning and students' motivation towards using it. It is also used to seek how does the ARCS model work based on the interaction between instructional materials and learners' motivation.

Several directional hypotheses have been tested based on the model in figure 1.1. According to Keller (1983), learning motivation is affected by four perceptual components: attention, relevance, confidence and satisfaction. Each component plays a critical role in motivating the students throughout the learning process. Therefore, student performance was assessed to identify the impact of SMS-based learning in their daily learning process. This requires the researcher to emphasize on the pre-test and the

post-test scores prior to and after the implementation of SMS based learning. Therefore, the following hypothesis is formulated:

Ha_1: There is a significant difference between the pre-test and post-test scores of the experimental group and the control group.

Keller (1993) had developed a measuring instrument called Instructional Material Motivational Survey (IMMS) as a data collection tool. This was used to diagnose motivational problems within instructional materials. According to Bohlin and Milheim (1994), IMMS was not developed specifically for the evaluation of computer-assisted instructional materials but it was originally developed for paper-based instructional materials. It has been widely adopted in multimedia learning. Therefore, a measuring instrument known as Instructional Material Motivational Survey (IMMS) taken into consideration to identify the interaction between instructional materials and learners' motivation by proposing the following hypothesis:

Ha_2: There is a significant difference between Instructional Material Motivational Survey (IMMS 1) and Instructional Material Motivational Survey (IMMS 2) on students' motivation.

According to Hidekuni (2011), attention and satisfaction won higher scores compared to relevance and confidence. Moreover, Huang et al. (2006) findings indicate that the attention and satisfaction components were found to be less representative in the IMMS. In contrast, Hidekuni (2008) found that the correlation between the factors in the ARCS model increased as the learning progressed. This resulted in the instructors preparing their teaching materials in a manner that the four factors of the ARCS model are balanced. However this study believes that ARCS components have positive relationships between the factors.

The following hypothesis was formulated.

Ha_3: There is a significant relationship between attention, relevance, confidence and satisfaction.

Attention refers to the learner's response to perceived instructional motivations provided by the instructional materials. It is important to design instructional material that effectively engages at the beginning of and maintained throughout the learning process at a level that will arouse the learner's attention and curiosity (Keller, 1983). Attention is expected to have a positive relationship with other variables towards using SMS based learning.

"Relevance helps learners to associate their prior learning experience with the given instructional materials; it also enables learners to understand the applicability of learned knowledge or skills in their future tasks" (Keller, 1983). Nwagbara (1993) reported positive findings about building a relevance component in instructional material to improve learners' motivation. Herndon's (1987) study showed that students are more motivated and performed better on achievement assessments when they were given instructions which were relevant to them.

According to Keller (1983), confidence stresses the value of building learners' positive expectation towards the learning task. Meaningful experiences support learners' confidence development during the learning process. In this construct, the confidence is considered as the independent variable and satisfaction towards using SMS based learning as the dependent variable.

"Satisfaction comes when learners are allowed to practise using newly acquired knowledge or skills and to receive feedback in a manner that leads to positive attitudes towards the learning task" (Keller, 1983).

The presented hypotheses derived from the statement of problem, objectives of the study and research questions of this research will be tested at a significance level of .05.

1.7 IMPORTANCE OF THE STUDY

The purpose of this study is to investigate the influence of SMS-based learning and students' motivation towards using it. It is also to pursue how the Park's (2011) modified pedagogical framework of mobile learning model works based on the interaction between instructional materials and learners. Therefore this study attempts to identify the application of learning contents based on Park's (2011) modified pedagogical framework of mobile learning and students' motivation based on ARCS motivational model. The importance of this study is the unique feature which mobile phones offer as a great opportunity towards educational paradigms. The flexibility and reliability of SMS as a communication tool has enabled it to be used as a learning instrument. Hence, the course contents can be delivered to the students via SMS and it is also known as an interactive teaching mechanism whereby the messages are in push and pull mode.

In this case, Lawrence (2011) used text messages to deliver information or learning contents, offered convenience to the users as it produce the benefits of being able to get small amounts of information easily and quickly. Pedagogically articulated contents specifically for mobile phone should be developed to ensure users will continue

to use and enjoy every segment of information being transmitted. It would act as an immediate bridge in communication and activity before a more comprehensive discussion could ensue in class or through the electronic portal (Sarah, 2011).

Issham et al. (2010a) added that there is no problem to utilize SMS-learning as an extension to the existing learning mechanism. This is because mobile-learning has a potential to be a mechanism because of the unique features, such as available at anytime and anywhere. However, Herndon's (1987) study indicated that students were more motivated and performed better on achievement assessments when they were given instructions that were relevant to them.

Therefore, this study emphasized on course contents and the learning materials which had been developed based on Park's (2011) modified pedagogical framework of mobile learning, to investigate the influence of instructional design of SMS based learning content and students' motivation in using it.

1.8 THEORETICAL UNDERPINNINGS

This study applied Park's (2011) modified pedagogical framework of mobile learning to develop SMS-based learning content. The conceptual framework was generated based on high versus low transactional distance and individualized versus socialized activity which has been applied in this study. Several elements such as

language, technology, tools and signs mediate all of the social aspects of human activity theory have been used to modify transactional distance theory. After the modification of the four types of mobile learning, it generated in the context of distance education which included (1) high transactional distance socialized m-learning, (2) high transactional distance individualized m-learning, (3) low transactional distance socialized m-learning, and (4) high transactional distance individualized m-learning. This study applied Park's (2011) second type of modified pedagogical framework of mobile learning.

According to Park (2011), the greater flexibility and portability of the second type of mobile learning shows an extension of e-learning. This type has assisted the instructor (lecturer of Principal of Finance) to designed the SMS-based learning content namely fact, example, question and answer. Acording to Park (2011), second mobile learning activities can be classified as type 2 when:-

i) *"The individual learners have more psychological and communication space with the instructor or instructional support.*
ii) *The individual learners receive tightly structured and well organized content and resources (e.g., recorded lectures, readings) through mobile devices.*
iii) *The individual learners receive the content and control their learning process in order to master it.*
iv) *The interactions mainly occur between the individual learner and the content."*

Apart from this, to analyse students' motivation based on SMS-based learning Keller's (1983), ARCS motivational model has been applied. This study is developed through previous researches on students' motivation with ARCS instructional model (Keller, 1983) and its variances were introduced by the scholars in the field. This study administered Keller's Instructional Material Motivational Survey (IMMS) to analyse the students' motivation. The second objective of this study is to examine students' motivation towards using SMS based learning contents which was based on Keller's (1983) ARCS components.

According to Huang (2006), to facilitate the implementation of the ARCS model during the developmental phases of instructional design, Keller (1993) developed a measuring instrument called the Instructional Material Motivational Survey (IMMS) to serve as a data-collection tool to diagnose motivational problems within instructional materials. The IMMS (Keller, 1983) based on the attention, relevance, confidence and satisfaction (ARCS) motivational design model (Keller, 1987a) is used in this study. In addition, this study obtained its theoretical underpinning from ARCS model of Keller (1983).

Keller developed a model for including motivational elements in course design. He defined four elements in his ARCS Model of Motivational Design (Keller, 1983): attention, relevance, confidence and satisfaction. The first element is attention, which is

about engaging and maintaining learner interests and curiosity. Interest is a condition that exists when there is an unexpected or inconsistent event in the perceptual environment, or when there is a gap between a given and a desired state of knowledge. Examples of strategies to increase learner interest and curiosity are (Keller, 1983):

- Use novel, surprising, incongruous or uncertain events in instruction
- Use anecdotes and other devices
- Use analogies to make the strange familiar and the familiar strange

The second component is relevance, which is about relating course content to learner interest and needs. For motivation to be sustained, it requires the learner to perceive that important personal needs, motives or values are being met by the learning situation or a specific task. Examples of strategies to increase relevance are (Keller, 1983):

- Show how the instruction relates to what the learner already knows
- Use concrete language and use examples and concepts that relate to the learner's experience and values
- Present goals for accomplishment or have the learner define them

The third component is confidence, which is about enhancing learner confidence in understanding course content. Personal motivation will tend to increase when the personal expectancy for success increases. Personal expectancy for success is influenced by three elements: past experience with success or failure at a given task, locus of control (a person's perceived internal versus external control over reinforcements) and

personal causation (the personal conviction that one can execute the behaviour required for successful performance (Brouwer, 2006). Examples of strategies to increase expectancy for success are (Keller, 1983):

- Use instructional design strategies that indicate the requirements for success
- Make learners aware of performance requirements and evaluative criteria
- Use attributional feedback which helps learners to connect success to personal effort and ability

The fourth component is Satisfaction, which is about encouraging learners' active involvement in learning and managing intrinsic and extrinsic reinforcement. Examples of strategies to increase satisfaction with the instructions are (Keller, 1983):

- Reward accomplishment by using positive feedback
- Use motivating feedback following the response
- Provide the opportunity for learners to use the new skills and knowledge learned during the course

1.9 CONCEPTUAL FRAMEWORK

The conceptual framework of this study was formed by the following theory and model:-

- Park's (2011) modified pedagogical framework of mobile learning.
- ARCS Model of Motivational Design (Keller, 1987)

Figure 1.1 depicts the research model used in this study. The demonstrated model consists of two-dimensional variables based on the ARCS model and Park's (2011) modified pedagogical framework of mobile learning. The framework postulated the independent variable that would show significant variance on the two dependent variables. The independent variable of the study is SMS-based learning content based on Park's (2011) modified pedagogical framework of mobile learning. Students' motivation and students' achievement are the dependent variables in this study.

Motivation has been identified as the essential component that stimulates and sustains learning behaviour (Berliner & Gage, 1998). Sankaran and Bui (2001) suggested that the higher the motivation level, the better the students perform in various instructional settings. Therefore, ARCS model through IMMS has been applied to investigate the influence of instructional design of SMS-based learning on students' motivation towards using it. Previous studies indicated that motivational issues are fundamental factors that drive a student's academic performance (Ames, 1992; Anderman & Maehr, 1994; Bandura, 1997; Weiner, 1985). Thus, students' achievement have been taken into consideration.

According to Kert (2011), the reason for the use of SMS in mobile learning environments can be attributed to the minimum level of technological requirements and providing simplicity in practical application environments. The design of learning contents is defined as the extent to which learning contents are designed and developed to fit the student's needs (Lee et al., 2009). The better the quality of services provided by SMS learning, the greater would be the tendency of learners to have a more positive attitude toward SMS-learning.

Therefore, the current study focuses on course contents and learning materials developed based on Park's (2011) modified pedagogical framework of mobile learning to investigate the influence of instructional design on students' motivation and students' achievement towards using it in the learning. Sachs (2001) added that a positive relationship between students' motivation towards achievement. Figure 1.1 illustrates the conceptual framework of the relationship between learning contents and motivation toward SMS-based learning.

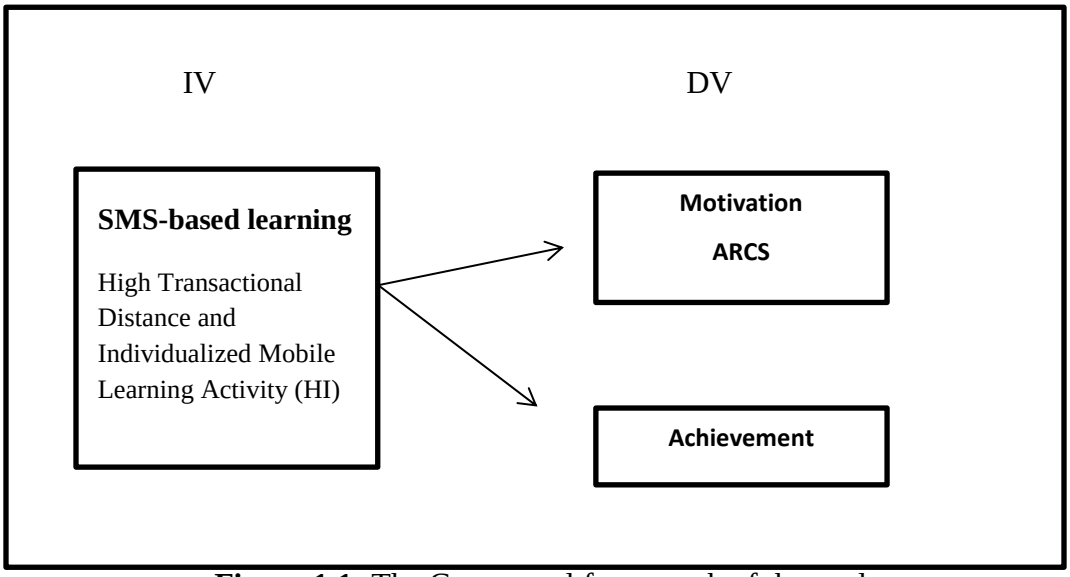

Figure 1.1: The Conceptual framework of the study

1.10 LIMITATIONS OF THE STUDY

All studies have limitations (Puhan, 2012). This study has several limitations. First, this study was conducted at and restricted to the Universiti Sains Malaysia (USM), and the findings are solely from the School of Management, USM. The population of the study is Management students, but the sample was only Principles of Finance students.

Because the study was conducted only on the Principal of Finance first year students from the School of Management, only information on the perceptions and the ability of these students were gathered. Thus, the perceptions of language school students, pharmaceutical students, and other school students on SMS-based learning are unknown. Conducting research that involves the entire studentry at this university at a given time is impossible.