



Full time students' motivation evaluation for SMS based learning content using arcs model of motivational design

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ABSTRACT

Emerging development in mobile learning and technology has offer great opportunity in education. The flexibility and reliability of mobile devices allow us to meet new pedagogical innovation in the education field. In this study, the use of SMS-based learning system (m-learning) towards full time Management students' motivation have been analyzed. A quantitative analysis was used to identify is there existed a significant difference on students' motivation between IMMS 1 and IMMS 2. Keller's (1983) ARCS model was widely applied to designed and developed the course content and Instructional Material Motivational Survey (IMMS) has been used to collect the data. Paired samples t-test was carried out to scrutinize is there existed a significant difference on students' motivation between IMMS 1 and IMMS 2. The findings illustrated that, there is existed difference between mean scores of students' motivation of IMMS 1 and IMMS 2 and a significant difference between relevance and satisfaction after the implementation of the SMS based learning.

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Introduction

There are several types of learning systems we have such as conventional teaching, instructional learning, electronic learning and mobile learning (Alonso and Norman, 1996). According to Chiou, (2010) stated that all teaching methods can be classified as traditional or non-traditional and the traditional method synonym with the conventional lecture-based method. The traditional curriculum is discipline oriented and each discipline has its own logical structure and sequence, which is complimented by standard text book (Jayawickramarajah, 1996).

Moreover some students may remain silent in the lecture class and not able to understand a word that has been spoken by teacher because in this system students and teachers are not equally involved. Even some students complain that some teachers dislike any question regarding the topic being taught (Abdul-Ghaffar, 1999; Guilbert JJ, 1998). According to Newble and Clarke (1986), teaching approach of the traditional school is not ideal because it limits patient contact in small groups, especially in first and second year students (Boyd, 1996). Moreover teamwork is one of the most neglected areas in the traditional medical schools (Thomas, 1997).

Furthermore, Garcia-Capero, 2008; Renzulli, 1999a, 1999b conclude that lecture method does not meet the multiethnic needs of students' learning and limits the construction knowledge because rote and passive learning characterize it. Therefore, Conner (2004) argues that a learner-centered teaching method would be most appropriate at the higher education level, because students are mostly adults who bring diverse ethnic experiences that can be activated and applied to engage them in learning and in the construction of knowledge. Allen and Presnal (2000) emphasized that there is a positive correlation between the technology and accessibility of information in education.

Background

Bridge (2001), found that "e-readiness assessments are a valuable tool to gain more informed, region specific understanding and to develop an action plan". Sachs (2003) added that, if information and communication technologies are utilized they could help create a trained, educated and healthy workforce capable of building a vibrant and successful economy. Briefly, Technology allows students to become much more engaged in constructing their own knowledge, and cognitive studies show that ability is key to learning success (Susan Henderson, 2008). Emerging development in mobile learning and technology has offer a viable opportunity for education.

A study done by Malaysian Communication and Multimedia Commission (MCMC) found that in Quarter 1, 2011 the penetration rate for cellular phone in Malaysia is 121 per 100 inhabitants. Penetration rate over 100% occurs because of multiple subscriptions. The changes of lifestyle and the advances of ICT have influenced our education systems too. As discussed earlier, mobile technologies, particularly mobile phone combine both ubiquity and utility in sense of communication and computation. These advantages gave us great opportunities to employ mobile technologies widely especially in education than just as communication tools.

Mobile devices are playing a vital role in every student's life, especially mobile phone. Unique features of mobile phone offers great opportunity towards learning mechanism. The flexibility and reliability of SMS as a communication tool has enabled it to be used as a learning tool. SMS-based learning system can be conducted with normal ordinary mobile phone seems not all students able to own expensive mobile phone or PDA's. Course contents can be delivered to the students via SMS and it also known as interactive teaching whereby the messages are in push and pull mode.

This is because m-learning has a potential to be a mechanism. First is because of ubiquitous, at anytime and anywhere we want. These statement was supported by Trinder (2008) which is more emphasis should be placed on mobile devices and universal free access to high-speed network from anywhere within the campus. The second point is flexibility, means that flexible time in delivering course content. Chan (2005) used the term “seamless learning” to describe these new situations. Seamless learning indicates that student can learn wherever they are curious in a variety of scenarios.

Third is affordable meaning SMS supported by all ordinary mobile phones. According to Roschelle (2003), research attention should be directed at identifying those simple things that technology does extremely and uniquely well, and to understanding the social practices by which those new affordance become powerful education interventions. Apart from that, mobile learning is also faster and cheaper which does not rely on internet connection. These statement supports by Markett (2006), implies that it allows for low-cost implementation of real time and text-based interaction. Last but not least, mobile learning is required simple mobile technology and the learning process becomes more enjoyable. Based on Katz (2011) contention by using technology, children are feeling “more of sense of mastery and are feeling good about themselves. Kukulska-Hulme and Traxler (2005) maintain that mobile technologies can support diverse teaching and learning styles and lend themselves particularly well to personalized, situated, authentic and informal learning.

Furthermore, m-learning provides the opportunity for learners to vary their study location and to study “on the move” which enables them to study whilst travelling on transport (Evans, 2008). As a results, his study indicates that the use of portable technologies makes it simpler for learners and educators to transmit their teaching and learning materials when and where they want. In addition, he added that since learners normally have their devices with them, it also facilitates “just-in-time” learning where learners can often take advantage of unexpected free time to study and make revision. The differences between m-learning and e-learning are e-learning requires internet connection and computer to access but m-learning does not required and students may can access at anytime and anywhere they want.

According to Sarah (2011), mobile learning via SMS technology is highly endorsed as long as it provides convenience and usefulness to the users. As a result of the study, a strong relationships existed between design of learning contents and perceived ease of use ($\beta = 0.299, p < .05$), between perceived convenience and perceived ease of use ($\beta = 0.652, p < .05$), and between perceived convenience and perceived usefulness ($\beta = 0.369, p < .05$). The study also discovered a significant relationship between perceived ease of use and perceived usefulness ($\beta = 0.405, p < .05$), and reliable relationship between perceived convenience and intention to use ($\beta = 0.582, p < .05$). However, she suggested for in-depth investigation of the SMS-learning instructional design to find the most effective design for teaching and learning.

With the increasing use of technologies in teaching, message design also involves applying a variety of theories (perception, learning, communication and systems) to the design and evaluation of instructional media (Lohr, 2011). Moreover, to better predict, explain and increase user acceptance, it is important to understand why people accept or reject information

system (Singh, 2005). Therefore this study emphasized on design of effective learning contents which is fact, example, question and answer and students' motivation towards to use it.

Crookes & Schmidt (1991) stated many studies of human learning have shown that motivation is a key to learning. Previous researchers have indicated that it is very important to examine the individual differences in student motivation in order to describe and understand the connection between students' personal characteristics and academic achievement (Pintrich & De Groot, 1990). Maslow (1970), added that intrinsic motivation is superior to extrinsic motivation according to his hierarchy of human needs. Keller (1979) believed that external conditions could be successfully constructed to facilitate and increase learner motivation. Keller (1984, 1987a) has integrated several learning theories and developed the ARCS (Attention, Relevance, Confidence, and Satisfaction) model. Attention refers to the extent to which learners' curiosity is aroused and sustained over time. Relevance refers to learners' perception that the instruction is related to personal needs or goals. Confidence describes learners' perceived likelihood of achieving success through personal control. Satisfaction refers to the combination of extrinsic rewards and intrinsic motivation and the consistency of expectations with outcomes (Keller, 1983; Keller, 1987a).

The ARCS motivational design model (Keller, 1983, 1987a, b) is widely applied when designing, developing and evaluating motivational strategies because of its applicability and practicability with instructional design processes (Huang & Johnson, 2002). Keller suggested that learning motivation is affected by four perceptual components: attention, relevance, confidence and satisfaction. Past researches have indicated that motivational issues are influential on instructional outcomes, because they are the fundamental factors that drive a student's academic performance (Ames, 1992; Anderman & Maehr, 1994; Bandura, 1997; Weiner, 1985). The development of the ARCS model originated from various learning and instructional theories (Driscoll, 2000; Steers & Porter, 1983).

Keller (1993), has developed a measuring instrument called Instructional Material Motivational Survey (IMMS) as a data collection tool to diagnose motivational problems within instructional materials during the design and developmental phases of instructional materials. According to Bohlin & Milheim (1994), IMMS was not developed specifically for the evaluation of computer-assisted instructional materials but the instrument was originally developed for paper-based instructional materials. Keller's primary assumption as to how the ARCS model works is based on the interaction between instructional materials and learners. However, each component plays a vital role in motivating students throughout the learning process. Therefore the purpose of the study is to answer the following research question:

1. Is there existed a significant difference on students' motivation between IMMS 1 and IMMS 2?

Methodology

The aim of this study is to identify the difference among Management students' motivation towards mobile content which is known as Short Message Services (SMS) based learning.

Research Design

There are several types of quantitative methodologies can be applied such as survey and experimental approach. However, a quasi-experimental one group pre and post test research approach was adopted in this study. The ARCS motivational design model (Keller, 1983, 1987a, b) is applied when

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Research Respondents

The quasi-experimental one group pre and post test method has been used in this study and the population of the study was 40 full time students of School of Management, USM. The students were selected from course of Principal of Financial who are voluntarily take part in SMS based learning and agreed to use their mobiles as a medium of communication.

Data Gathering Method

This study carried out for eight weeks and the learning contents were sent through SMS. The disseminated learning contents were concurrent with learning materials (Principal of Financial) which were developed by Management School lecturers and approved by the subject's lecturer before delivered to the students. Every day the students have received two messages which known as fact and example on the first day and followed by question and answer on the next day. The quasi-experimental one group pre and post test was used and the modified IMMS questionnaires were distributed for two times which was in earlier of the study and after the implements of the SMS based learning. By way of this, the researcher enables to identify the difference between students' motivation on earlier and after the implementation of SMS based learning.

Measurement and Analysis

The original IMMS contains 36 Likert-scale survey items which is associated with each component of the ARCS model (DeVellis, 2003). The participants of IMMS asked to rate their response from 5-point Likert scale, where 1=strongly disagree, 2=disagree, 3=neutral, 4=agree and 5=strongly agree. According to Elmore & Beggs, (1975), 5-point Likert scale is better than increase the scale from 5 to 7 or 9 points, which will not improve the reliability of the ratings. This questionnaire designed in both English and Malay languages for the better understanding. The paired samples t-test analysis was carried out in order to scrutinize the difference between student's motivation on the earlier stage and after the implementation of SMS based learning.

Findings

The IMMS questionnaires were distributed for two times; early and after the study and 40 full time students' of Principal of Financial were involved in this study. These answered questionnaire which known as data of the study has been used for the analysis. Hence, to identify is there existed a significant difference between the means of IMMS 1 and IMMS 2, the paired samples t-test was carried out and the results were depicted in the following Table 1.

Paired Samples T-Test for IMMS 1 and IMMS 2

Pair	Mean IMMS 1	Mean IMMS 2	t	Sig (2-tailed)
Attention	2.9583	3.0312	-1.460	.152
Relevance	2.6861	3.4000	-8.940	.000**
Confidence	2.9250	3.0194	-1.215	.232
Satisfaction	3.0375	3.3542	-2.527	.016**

**Sig 2 tailed $p < .05$

Based on the table, the mean scores of IMMS 1 and IMMS 2 were measured against 5 point scale. The overall mean scores of IMMS 2 increased from the mean scores of IMMS 1 after the implementation of SMS based learning for eight weeks (2 months). This implies that, students' motivation on SMS based learning was increased and they were adopted to new learning approach after eight weeks of time.

The highest mean score in IMMS 1 is satisfaction (3.0375) and the lowest is on relevance (2.6861). This shows that, at the earlier of the study students' were satisfied with new learning approach which was the contents were sent through SMS but they did not agreed on other factors such as attention, relevance and confidence of this SMS based learning. In contrast, after the implementation of SMS based learning the highest mean score in IMMS 2 is on relevance (3.4000). It can be concluded that, students really can see the relevance of the contents we had sent (fact, example, question & answer) and they were enjoying new assisting tool in their learning.

Although the students are showing their interests on new learning approach (SMS based learning) but their confidence level is very low if comparing with other factors which is 3.0194. This is because, according to students' additional statements in the questionnaires they are looking towards extra ordinary contents such as via MMS, Bluetooth and etc to completely assist them in learning. However, there is existed a significant difference between the means of relevance (t: -8.940; $p < .05$) and satisfaction (t: -2.527; $p < .05$) after the implementation of SMS based learning.

Conclusion

The flexibility and reliability of mobile devices, especially mobile phone offers great opportunity towards learning mechanism. More emphasis should be placed on mobile devices and universal free access to high-speed network from anywhere within the campus (Trinder, 2008). Brown (2005), added that mobile applications are known as most useful and convenient way for teaching and m-learning is a form of e-learning that employs wireless communication devices to deliver content and learning support. Therefore this study was attempted to identify the difference among Management students' motivation towards mobile content (SMS based learning) which was designed and developed based on ARCS motivation model (fact, example, question & answer) and Keller's (1993), Instructional Material Motivational Survey (IMMS) has been used to collect the data. Eventually the researcher enables to achieved the research objective by designing effective course content based on ARCS model.

Paired samples t-test was carried out to scrutinize is there existed a significant difference on students' motivation between IMMS 1 and IMMS 2. The finding illustrates that, there is existed difference between mean scores of students' motivation of IMMS 1 and IMMS 2 and a significant difference between relevance and satisfaction. This results indicate that, SMS based learning system which was designed and developed based on ARCS motivational model had successfully assisted the students in their learning. The findings of this study was strongly supported by the research of Sarah (2011), mobile learning via SMS technology is highly endorsed as long as it provides convenience and usefulness to the users. It is believed that, the future studies will be emphasized on further contributions of mobile application among full time students.

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