Volume 1, Number 1, February 2011

Middlesex Journal of Educational Technology

Middlesex University

This inaugural edition of MJET is dedicated to Alex Moon (1970 - 2010), the founding editor of the journal.

Middlesex Journal of Educational Technology is an online journal published by Middlesex University. All articles published in this journal are peer-reviewed. The journal is interdisciplinary in approach and will include academic articles, research initiatives notes, conference and book reviews, and software and technology reviews. The articles and papers are directed towards the study and research of e-learning in its diverse aspects: pedagogical, curricular, sociological, economic, philosophical, and technical that contribute to the development of both theory and practice in the field of e-learning.

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Middlesex Journal of Educational Technology is available online (ISSN 2041-2762).

Middlesex Journal of Educational Technology is published annually.

Using the Familiar: How m-Learning (SMS texting) Can Enhance the Student Learning Experience

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Abstract

Technological innovations have developed a wide range of commercial, industrial and personal applications. Technological growth has also facilitated developments in the delivery of innovative approaches in distance learning. This paper examines the use of SMS technology for the development of an active approach to learning on the part of students, by complementing and enhancing their learning experience. It outlines the context in which this development has taken place, noting the increasing and worldwide use of mobile technology. It then reviews the relevant literature in the field, and outlines the methodology used for this preliminary study. It also describes the innovation and identifies its unique feature: it requires participating students to provide a rationale for their text response to a case example, rather than just a yes/no or multiple-choice selection. Finally, implications for the future in terms of further developments are identified.

Keywords: short message services, SMS, education services, mobile learning, e-learning, mobile phone, interactivity

Introduction

In recent years technology has provided a growing number of opportunities for the development of a wide range of commercial, industrial and personal applications. Technological growth has also facilitated key developments in the delivery of new models of learning from distance learning (d-learning) to mobile learning (m-learning). According to Sariola et al. (2001) 'the term "m-Learning" has lately emerged to be associated with the use of mobile technology in education. It seems, however, that it is used in commercial purposes rather than as an educational concept. We wonder if the term is a commercial trick to market technology and educational services or if it is an emerging concept that educationalists should take seriously'. According to Keegan (2002) m-learning has emerged out of the technological innovations associated with the wireless revolution. In several cases, the arrival of digital mobile technologies, and the growing interest in their deployment for mobile learning, has changed the way we think about the process of teaching and learning. Mobile learning offers either alternative or complementary modes of learning that match student preferences, which in turn are derived from the growing technological sophistication of this group. Few studies have explored how to use existing mobile infrastructures for educational purposes. Additionally, there is a limited amount of literature regarding the ways in which mobile communication could complement traditional learning and teaching contexts for conducting tests and providing formative and summative feedback to learners, using a multiple-choice selection method or the true/false method. This paper investigates how the learning experience of postgraduate students in the Marketing and Enterprise Department of

Middlesex University in London was supported and enhanced with the use of mobile Short Messaging Service (SMS) communication. It examines the educational use of texting for assessment and feedback purposes and describes the process involved answering short questions with short word answers. Finally, the paper will report the results of an exploratory study undertaken to evaluate the effectiveness of using the Short Messaging Service (SMS) among postgraduate students in marketing.

The Growth of SMS Technology

Short Message Service, commonly known as SMS, was developed as part of the Global System for Mobile Communications (GSM) and it appeared on the market in 1992. It allows mobile systems to exchange text messages of a maximum length of 160 characters (Dornan, 2000). SMS is a well-established technology which is heavily used internationally and provides quick, reliable and efficient communication between the parties involved. It has been used for multiple purposes such as for voting in the UK local elections in 2002, for accessing banking details, traffic announcements or even weather forecasts (Jones, 2002). According to Stone and Briggs (2002), SMS has a quicker response time for interactive learning activities in the education context than email.

The World's Telecommunications Database (2008) revealed that by the end of 2007, almost one out of two people had a mobile phone. In Europe, penetration has reached 100% of the market. More than one out of four Africans and one out of three Asians have a mobile phone. As well as their popularity, highs level of competition and decreasing prices have resulted in a substantial reduction in what has become known as the 'digital divide', at least in respect of mobile or cell phones. The mobile sector continued to grow by 3.8% in 2007 reaching sales of €137 billion. It remains the largest segment of the telecommunications market. There are now more 3G networks, which are the more up to date platform, offering mobile services than 2G networks. Figure 1 illustrates the ICT penetration rates for the year 2007 ('World Telecommunication/ICT Indicators Database,' 2008).

Short Message Service (SMS) is a globally accepted wireless service that enables the transmission of alphanumeric messages between mobile subscribers and external systems such as electronic mail, paging, and voicemail systems ('International Engineering Consortium,' 2007). SMS provides a mechanism for transmitting short messages to and from mobile devices.

Mobile phones have developed a new type of communication through SMS messaging, particularly among young people (Krause & Schwitters, 2002). Though most people use SMS technology for communication purposes, the growth in its usage can also be utilised in other ways which are productive of learning. It appeared initially in Europe in 1991 and since then SMS usage has recorded tremendous growth. In the EU, the average penetration rate continues to grow reaching 111.8%, and there are 19 Member States which have exceeded 100% penetration (Figure 2).

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The advancements in mobile phone technology make them ideal not only for on-the-go communication, but also for information sharing, training and learning purposes. While universities explore ways to enhance the student learning experience, mobile phones are becoming an excellent tool for incorporating learning and entertainment. Cheung (2004) establishes the technical feasibility of SMS as a medium to facilitate classroom experiments in economics, both in assembling responses from students and for reporting feedback to individual students.

The Use of Short Message Service (SMS) for Assessing Postgraduate Students

Technology has dramatically changed the way students experience university life (Hoare, 2008). It has affected where and how they study, helped them collaborate with each other and broken down barriers between students and teachers, social life and study. There is much evidence (Ferrell et al., 2007) regarding the benefits of using technological innovations to enhance learning and teaching practices. E-learning provides many ways to increase communication between class members and academic staff through the use of virtual learning environments (VLEs), Second Life, discussion boards and emails. Collis et al. (2001) validated an integrated theoretical model titled 4Es for identifying the impact of using telecommunications related technological innovations such as the world wide web (www), email, and video conferencing for learning-related purposes. The 4Es stand for: environment factors, educational effectiveness, ease of use and personal engagement.

The implementation of the above model is very much dependent on the organisational setting as well as on the individual's own self-confidence in making use of information and communication technology for learning purposes. Finally, and in respect of online tests, Elliott (1996) reported that students who undertook regular tests on a voluntary basis not only achieved better results in respect of the particular module with which these tests were associated, but also a higher overall classification in their degrees than those who had not participated. Fagerberg et al. (2002) define m-learning similar to distance education as 'the ability to receive learning anytime, anywhere and on any device', while Harris (2001) defines m-learning as 'the point at which mobile computing and e-learning intersect to produce an anytime, anywhere learning experience'.

Mobile and distributed work in international arenas pose new challenges to the development of e-learning. New methods are developed for the mobile learner in order to work effectively regardless of possible constraints of time and location. Portable multi-use mobile devices enhance collective learning and make it possible to record a learning process and accumulate a rich knowledge database ('International business built on the platform of e-learning,' 2007). Based on literature on both mobile and information learning, Jones at al. (2006) proposed six reasons why mobile informal learning could be motivating. Learners have control over their own goals, while mobile devices give their users a strong sense of ownership. In addition, mobile devices enable users to communicate as well as to use the devices as a medium for entertainment. Finally, mobile devices enable individuals to access information and resources in context and their portability feature can provide continuity in information and resources.

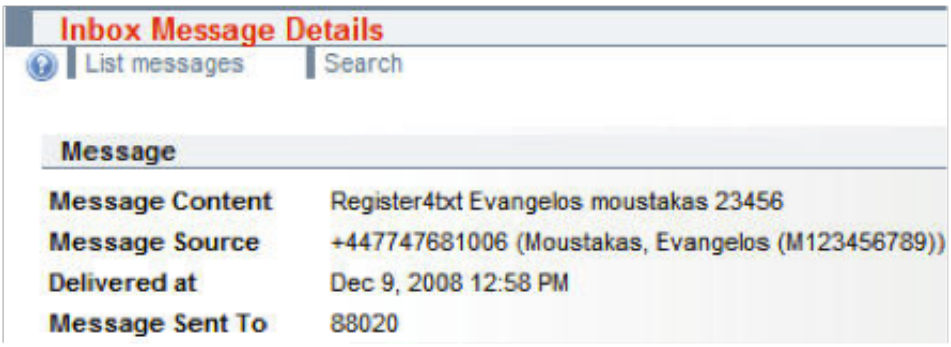
The use of mobile devices has now become commonplace around the world despite usability problems linked to small screen size (Waycott, 2004) and to entering data into the mobile device (Smordal & Gregory, 2003). Literature review and prior research with students informed the initial design of this initiative, which incorporated texting into the context of teaching a class in e-marketing for students who were enrolled in a postgraduate Marketing Management programme. Based on an Ofcom report (2007), it appears that mobile phones are extensively used by youngsters. It is reported that in 2006, 96% of the UK population aged between 15 – 24 use mobile phones regularly. In the same year, the Horizon report predicted that 'the capabilities of mobile phones are increasingly rapidly, and the time is approaching when these devices will be as much a part of education as a book bag' (New Media et al., 2007, p. 6). Carroll et al. (2002) discuss the role of mobile technologies in the lives of youngsters and identify reasons why new technologies are mostly adopted by younger generations. Based on extensive data collection and observation of young people who use mobile phones they propose an appropriation model.

Based on the evidence that students use mobile phones more than ever before, SMS technology was adopted as an element of the assessment process for the postgraduate e-marketing class. In part, this initiative utilised developments in communicative habits of the younger generation. The use of SMS as a means of providing students with information was initially introduced in 2005 as part of the e-marketing class. Thereby, students were continually and quickly informed of any changes within their e-marketing class. Up to this point, only email was used as a communications tool. However, email was not an effective solution as a significant number of students were not checking their Middlesex University email account on a regular basis and, as a result, would often not receive information in time. Instead, SMS messaging was used as a communication channel where students could receive notifications about guest lectures, assignment deadlines, room changes and class cancellations. In addition to the above communication, SMS messages were sent to students' mobiles as confirmation of receipt after they had submitted their coursework online. Below is an example of an SMS confirmation message:

> *'Thank you for the submission. Your assignment will be marked and feedback will be uploaded electronically by April 20.'*

The SMS assessment required students to reply to questions using text messaging. The project was developed initially in cooperation with the supplier of mobile enablement services Mkodo (2008) and helped to educate students in the use of innovative mobile communications. Since September 2008, the SMS assessment has been running in cooperation with Texttools (2008).

In July 2002, the European Parliament and the Council voted (Directive 58/EC, 2002) to ban Unsolicited Commercial Communication also known as 'spam'. Under Article 13 of the Directive the use of email and SMS (text message to mobile phones) is only allowed in respect of subscribers who have given their prior explicit consent to receive commercial communication. As a result, at the beginning of the semester, students were asked to register (opt-in) their personal information by texting to a five-digit telephone number. This information was saved at the SMS database (Figure 3)



An SMS was automatically sent to students' mobile phones as a confirmation for successful registration at the SMS database:

> *'Welcome to the MKT4009 e-marketing module! You are now registered. Dr Evangelos Moustakas.'*

A series of ten text messages each containing a question was scheduled to be sent out at a specific time during the period of the course. Each SMS included a case study, which the students were required to analyse, to identify the answer and to reply by sending a text message to their tutor.

This SMS assessment process enables academic staff to determine whether students' progress was satisfactory, and enabled them to compile and distribute information quickly and easily. This type of summative e-assessment saves time since the automated marking of the assignments of a large number of students now takes seconds rather than hours. Marks for the entire Master Class (fifty-eight students) were submitted within 20 minutes after the receipt of students' SMS responses on the system. For example, during week six, the topic of e-marketing

and online consumer law was introduced. After the lecture was completed, the following question was texted to students' mobile numbers:

> *An e-marketing company based in London wants to attract new customers online by sending emails to 10.000 random email users in Spain. Is the email marketing option needed?*
>
> *A. Yes, it is needed.*
> *B. No, text messaging or fax sending will be more efficient than email.*
> *C. Based on the above scenario, it is illegal for the company to send email marketing.*
> *D. Prior to the sending to 10.000 random email users, target research should be applied.*
>
> *Please reply to the SMS you received by typing first the letter of your answer (A, B, C or D) and a short rationale for your answer (No more than 130 characters).*

Students replied accordingly by sending a text message to the database and their answers were recorded. During the following week's lecture the SMS question was discussed and the correct answer (C above), together with the justification for this, was revealed. At the next page is demonstrated an example of a student's response.

Person Property	Property Value
2006-11-17	Registration
2006-11-17.1	D Since the target mar
2006-12-02	A Because e-marketing
2006-12-02.1	D Since global link info
answer	D There is no competit
first.name	Evangelos
last.name	Moustakas
message	D Since global link info
operatorid	3
operatorname	Orange (UK)
person.identifier	00447747681006
title	Mr

What differentiates this development from previous initiatives is that it goes beyond requiring a yes/no response or a selection from a multiple-choice menu because it requires the students to provide a rationale for their response. In doing so they have to revisit and utilise the lecture input they have already been provided with in the context of the case example and formulate their response in the light of this knowledge. As a result students become active, rather than passive learners and, via the process of using content input, are more likely to internalise and operationalise this input in the future: in effect the technology has provided them with a medium for deep learning.

There were no technological limitations to this method of assessment since all mobile phones, regardless of their age, can send and receive text messages. The SMS database also acted as a communication channel to notify students about events, news and important dates related to the module. The project enabled learners to participate in their learning by engaging with a process that encourages them both to conduct research and to actively respond. Additionally, the use and evaluation of this SMS development provided the foundations for creating a new module syllabus for the electronic marketing graduate students.

The use of SMS for communication purposes indicated that female students were more enthusiastic than male students about using this type of technology. This could be explained by the research findings of Hoeflich and Roessler (2001) that women prefer to communicate in writing rather than face to face.

Conclusions and Recommendations

The above study reflects the growing recognition that priority should be given to addressing students' needs and utilising their strengths during and after their transition into the higher education (Kember, 2001). According to Bryson (1997) the removal of structures such as family rules and school regulations may result in some difficulty and uncertainty for new students, especially during their period of acculturation to the milieu of higher educational institutions. Mobile learning is unique in that it allows truly anywhere, anytime, personalised learning. It can also be used to enrich and add variety to conventional lessons or courses. Evidence collected from student evaluation forms suggests that the use of mobile learning had positive contribution in various areas. Although students were involved in mobile learning for fairly short periods of time, it helped learners to improve their knowledge in e-marketing. Also, the majority of learners enjoyed the opportunity to use their mobile phones to learn independently and maintained their interest levels. In addition to that, mobile learning helped to remove some of the formality from the learning experience.

By using the familiar as a response to this requirement, the current study revealed that because all students had access to mobile phone technology, SMS technology provided a low cost, familiar and thus very attractive option to improve developmental and learningful communication between lecturers and students. Additionally, because of its sophisticated technological character, students could see the links between what they were required to do in respect of assessment and the content focus of the module. Because of the consistent message between the process of assessment and the module content, students developed more interest in learning the subject matter of e-marketing. The portability element enabled students to interact and share information easily from everywhere.

The use of SMS technology for teaching purposes enables the lecturer to reach students anywhere and saves a significant amount of travel time and frustration when changes or cancellations occur the last minute. Additionally, the project enabled learners to participate in their learning. This development will provide a clear and simple methodology for the active inclusion of work based learning students (who are in both full-time employment and are enrolled in structured, but off-campus learning) in the educational and assessment process and provide a means whereby their learning and their achievement can be enhanced. It will require a change of

focus. Rather than the question arising from the lecture input, it will flow from the learner's engagement with their workplace activities, that is, the social context of their learning (Billet, 2006).

At the same time, the gender difference in participation rates noted above needs to be addressed. Most importantly though, this exposition informs the debate which has been highlighted in the analysis of institutional audits report (2008) by the Quality Assurance Agency (QAA), whereby several academic institutions are exercised in respect of keeping some form of balance between e-learning and assessment, and more traditional forms of teaching and assessment. This preliminary study has demonstrated that text messaging can be used as an e-learning tool and can act in addition to the lecturer's didactic input in class. The question is no longer whether the use of m-learning strategies has positive impact on enhancing the learning experience, but rather how it could be better combined to the lecturer's teaching and learning portfolio. M-learning provides a means of developing and extending dialogue since students feel more in touch with the tutor and the academic learning portfolio. In other words, the use of mobile SMS technology enhances the effectiveness of traditional teaching methods rather than replaces them.

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