

TOOLS OF THE TRADE: CAN MOBILE TECHNOLOGIES ENHANCE THE LEARNING EXPERIENCE IN A TERTIARY ENVIRONMENT?

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Mobile learning is fast becoming a global phenomenon, resulting in a change to the way education is being delivered. As society is now experiencing 'mobility' in all spheres, it is unsurprising that mobile devices are being used by both learners and educators as a natural extension of the tools and technologies available to enhance the learning environment. Mobile learning aims to provide another layer of support to the students' learning experience, alongside other delivery methods to enhance and support the learning process. This paper describes the results of a study carried out in a New Zealand tertiary institution which investigated whether the learning environment could be enhanced through the use of mobile technologies and thereby enrich the student learning experience in a tertiary environment. Open-ended questions and focus groups were used to gather perceptions of the students' experiences of the mobile enhanced learning environment. The analyses confirmed that the mobile enhanced learning environment was a positive one and that the increased levels of communication relating to both the learning content and administrative matters was found to have made a difference to their learning experience. Students' responses also highlighted issues that educators need to pay attention to when using mobile technologies. The issues raised suggest that a consistent and planned approach is needed when designing, planning and implementing a mobile enhanced learning environment.

KEYWORDS: Learning Environments, Mobile Learning, Students' Perceptions

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INTRODUCTION

While there are many different ways to integrate technology into classrooms, it is important that they all focus on learning theory and educational practices. The use of technology should not occur without thinking about how people learn best (Jackson, Gaudet, McDaniel & Brammer, 2009). Clark and Mayer (2011) point out that too much of a focus on the role of cutting-edge technology may result in ignoring the role of the learner. Mayer (2009) believes in a learner-centred approach to learning with technology and holds that technological innovations require adaptation in ways that will support learning processes. As most tertiary institutions are experiencing rapid technological changes, continuous shifts in the learning environments, and a new generation of students exhibiting more advanced technological skills (Keengwe, 2007), it is important to consider the opportunities and challenges that educators face in order to effectively use technology to enhance learning.

Many technologies used in higher education today include the use and application of methods such as e-learning, online learning, web-based learning or blended learning, each often in combination with learning management systems. Oblinger and Oblinger (2005) assert that as technology changes, educational institutions must also adapt to these changes and that the notion of classrooms as a physical space only, needs to evolve to a concept of learning spaces that are not limited to floors and walls. However, it is important to note that for those students still engaging in face-to-face learning, expectations do include being taught knowledge and expertise from a teacher, but additionally these students expect teachers to use technologies to enhance and support their learning. "The use of technology in higher education should enrich and extend the student's exploration of new territory. Educational technologies are of little value if they do not add richness and dimensionality to the experience of learning" (Weigel, 2002, p. xiii). Reimer (2005) believes that it is not the technology itself that is improving student learning, but rather that the students' needs are being better met through the use of technology. Hagner and Schneebeck (2001) state that higher education institutions are challenged with creating a new institutional environment to accommodate and promote the use of these new technologies.

Rickards (2003) believes that while information and communications technologies can enrich the learning environment and enhance learning, it is of paramount importance that the teacher effectively facilitates the experiences and responds to individual student needs. He also holds that technology cannot replace the role of the effective teacher or facilitator completely – it only enhances what an effective teacher can provide in a classroom. Technology in higher education may work most productively as a learning tool, not only when

it is being used, but when reflection takes place as to how and why it is being used (Snart, 2010).

While the notion of using technology in higher education is not a new concept, the application of the latest information and communication technologies have the potential to make a positive impact on the learning experience. There are issues such as pedagogical appropriateness that need to be considered and as Beldarrain (2006) points out, not all technologies are appropriate for every situation - it is the responsibility of the instructional designers, administrators and technology experts to determine which tool offers the best solution for the particular learning environment.

Cochrane (2007) notes that as mobile devices are inherently social and because today's learners are constantly connected to their social networks, educators have the opportunity to harness the educational potential of such an environment. Ally (2009) believes that as more and more people use mobile technologies to complete everyday tasks and transactions, they will also demand access to learning materials using mobile technology. Swan, van't Hooft, Kratcoski, and Unger (2005) conducted research which indicated both teachers and students respond favourably to handheld devices, and that the students are more motivated, collaborate and communicate more, and benefit from having a portable and readily accessible tool.

In this study, a modified form of the Web-based Learning Environment Instrument (WEBLEI) (Chang & Fisher, 2003) was used to examine the effect that mobile devices have on student outcomes and the learning experience in a tertiary environment. The WEBLEI was modified and renamed the Mobile Learning Environment Instrument (MOBLEI). This modified learning environment instrument was used to gather quantitative data about the associations between students' perceptions of mobile technology enhanced learning environments and student outcomes in a tertiary environment that uses different delivery modes: online; face-to-face; and blended. To obtain qualitative data, open ended questions were included in the MOBLEI and students were invited to take part in focus groups. This paper discusses the results of the qualitative data that were analysed for this study.

METHODOLOGY

This study was undertaken in a New Zealand tertiary institution, where the researcher's role was to develop a learning environment instrument (MOBLEI) and analyse and report on results. Lecturers were asked to be active participants by administering the MOBLEI and by texting the identified student groups. The lecturers used texting software in order to send texts directly from

their computer keyboards. A purposive approach to sampling was undertaken. All students enrolled in the courses being surveyed were invited to be included in the study and no differentiation was made on the basis of ethnicity, age or gender. These students were categorised into one of three groups according to their mode of learning: online, blended, and face-to-face. The online students received all their learning resources via the web, while the face-to-face group of students attended classes on-campus and their delivery mode was a combination of lectures and practical classes. The students studying in a blended mode of learning completed their studies off-campus and used resource-based materials such as workbooks. The quantitative data were gathered by utilising a learning environment instrument in which scale items were classified and coded. The qualitative data were obtained through the open-ended questions within the MOBLEI and follow-up focus group questions. While this research used both quantitative and qualitative methods to gather data, the focus of this paper is to discuss the results of the qualitative data.

Open-ended questions are particularly useful when there are a range of possible answers and where the researcher may not be able to predict all the possible answers. The use of open ended questions therefore enables participants to give a free response rather than restricting them to a choice from among stated alternatives (Ary, Jacobs, & Sorenson, 2010).

Focus groups are particularly useful to identify any qualitative similarities and differences among participants in a research environment where a rich body of data can be gathered. This is due to participants being able to respond using their own words, expressions, thoughts and feelings (Stewart & Shamdasani, 1990). Participants for the focus groups were invited to take part by indicating their interest on a separate sheet when completing the MOBLEI.

RESULTS AND DISCUSSIONS

Open-ended questions were included at the end of the MOBLEI designed to gather further comments and gain a richer understanding of the perceptions of students around the use of mobile technologies and the associated benefits, advantages or disadvantages to their learning experience and environment.

The four questions in the open-ended comments section of the MOBLEI were as follows:

1. What other mobile devices, apart from your mobile phone, would you like to use while studying?
2. What are the advantages that you have encountered of studying in a mobile enhanced environment?

3. What are the disadvantages that you have encountered of studying in a mobile enhanced environment?
4. Are there any suggestions to improve the delivery of the course in a mobile-enhanced mode?

Question one asked students what other mobile devices, apart from their mobile phone they would like to use while studying. From the 28 responses to this question, many students indicated that they were satisfied with just using their mobile phones. Eight students noted laptops as being their next preferred mobile device. Four students noted iPods as being useful, with another three mentioning iPads or tablets.

The literature points to a new generation of students who are exhibiting more advanced technological skills (Keengwe, 2007) and who will expect teachers to use technologies to enhance and support their learning (Oblinger & Oblinger, 2005). There is beginning to be a significant uptake in the use of mobile technologies in higher education, therefore it is important for practitioners to consider fitness for purpose of the mobile technologies to be used, and ask questions such as what kinds of learners will benefit from using this technology, what sort of subjects and situations lend themselves to this type of delivery and whether it is possible to learn via small mobile devices (Kukulska-Hulme & Traxler, 2005).

The second question asked students what advantages they have encountered while studying in a mobile enhanced environment. There were 80 responses to this question and the majority of students indicated that the greatest advantage experienced was increased communication between themselves and their lecturer. A recurring theme was that students appreciated receiving reminders for a variety of class-related activities such as assessment deadlines, advice of when assessments were ready to be collected, changes to timetables, meeting times, and exam dates and locations. Students also commented that they found it an advantage to receive a text about a last minute change instead of having to check emails.

Question three asked participants what disadvantages they had encountered while studying in a mobile enhanced environment. Forty two students provided comments to this question with the majority of disadvantages listed as being distraction and connectivity issues. Students disliked receiving texts during lecture times as this caused distraction not only because they had received a message but because other students' phones may not be on silent, thus causing noise during class time. The main type of connectivity issues that students commented on included a delay in receiving texts that had been sent or not receiving a text that had been sent.

Responses to question three provided valuable comments from students regarding perceived disadvantages of their learning environment that were not obtained from the quantitative data. Similar issues to those raised in this research have been found in previous studies which have shown that the use of devices, such as in-class laptops, have had a negative impact on student learning, with students being distracted from their lessons (Fried, 2008; Hembrooke & Gay, 2003). The literature notes the challenges surrounding the use of technology in higher education and cautions that technology needs to be used in theoretically sound ways in order to enhance learning (Herrington & Kervin, 2007).

Question four asked for any suggestions that students might have to improve the delivery of their course in a mobile-enhanced mode. There were 24 responses to this question and the main suggestions included consistency between lecturers in the use of texting; sending texts at a certain time of day, and providing students with credit to enable them to text back to lecturers. The responses from the open-ended question number four were useful in highlighting specific ways in which these improvements could be made.

Seven questions were formulated for the focus group as a prompt to stimulate discussion. These questions are provided below:

1. Can you describe in what way mobile phones were used by your lecturers during your programme of study?
2. Do you think the use of mobile technologies enhanced your learning experience?
3. Was the amount of contact using the mobile device appropriate?
4. Was the content delivered using the mobile device appropriate?
5. Are there any other ways you think they could have been used?
6. Do you think the contact you received via the mobile device increased your motivation?
7. Are there any other mobile tools you would to use e.g.; iPods, PDA's? In what way do you think they could be used?

The focus groups were valuable in gaining further perspectives of the students' experiences of their mobile enhanced learning environment. They were also helpful in allowing the quantitative results to be analysed and compared to determine if any of the findings converged, contradicted each other, or were inconsistent.

Students reported that the majority of texts they received were for assessment reminders, study tips and advice on test results. All participants were in agreement that receiving texts had made a difference to their learning

experience with comments that they appreciated being noticed by lecturers and had a heightened sense of being cared about. The students considered the level of contact from their lecturers via texts was very appropriate and the overwhelming response from participants was for an increase in the use of texts, both in frequency and consistency, i.e. more widely used by all lecturers. These comments confirm feedback received from the open-ended questions and quantitative results which showed that students would prefer more of everything. When asked whether the content of texts was appropriate, the comments were positive and the participants confirmed that they would not want to have too much content sent via text as some did not have phones capable of viewing more than just a text message.

Suggestions of other ways mobile devices could have been used were for administration type advice such as library books being due and receiving exam results. Students all believed that their motivation to study and attend classes had increased through the increased communication they received via texts. Just the fact that their lecturer cared or might notice them not being in class was enough to motivate them to get out of bed in the morning. When asked what other mobile tools they would like to see used and how they would use them, responses varied from smartphones, iPods, and iPads including suggestions for the creation of applications like Moodle that could interface with their smartphones.

CONCLUSIONS

Qualitative data from open ended questions and focus groups provided insight into whether the use of mobile technologies had enriched the students' learning experience. The responses from the open-ended questions and focus groups added a rich layer of understanding into students' perceptions and provided confirmation that the mobile enhanced learning environment is a positive one for those students who participated in the study.

Students stated that other mobile devices they would consider using in their study were mainly laptops, followed by iPods and iPads respectively. Rickards (2003) provides a perspective that technology-based futures in education will always be linked to the technology that is currently available, which will be driven by what people want to use the technology for. There is no doubt that mobile devices will continue to gain popularity, not only to complete everyday tasks and transactions (Ally, 2009), but to demand greater access to learning materials anywhere, anytime (Mellow, 2005).

The main advantages provided by students were the increased level of communication and the receiving of texts for reminders about assessments and

timetable changes. These advantages were also cited in Attewell and Savill-Smith's (2005) UK study. They found that mobile phones were suited to sending text messages to students reminding them to study for exams and as an effective way to attract, motivate and retain students.

The disadvantages encountered were predominantly around distractions due to texts being received during class time and connectivity issues. This was valuable feedback to receive as lecturers were unaware of the consequences of sending a text message out to an entire class of students at a time when they were in a timetabled class. This created distractions to other students due to the text message notification tone, and an unnecessary distraction for the lecturer when students felt compelled to check their messages in class time. Connectivity issues arose with some students not receiving a text that had been sent to them. This problem can be one of the drawbacks of text messaging in that there is no certainty that a text has been received. Due to this, it is necessary for lecturers to be mindful that a total reliance on text messaging could be a risk when providing important information - consideration may need to be given as to whether a combination of communication methods such as email and posts on learning management course sites would be required.

Suggestions for improvements were consistency in the use of mobile devices by lecturers and the provision of credit so that students could respond to texts without the financial constraints of not having available credit on their phones. The students in this study appreciated the increased interaction and enjoyment that their learning environment provided, so much so, that they would have liked all their lecturers to have communicated in the same way. This is an important consideration when designing a mobile enhanced learning environment to ensure that all teaching staff are aware of the need to co-ordinate and plan how and what they will communicate to students in a consistent way. While research has shown that a large majority of students have access to a mobile phone (Mellow, 2005), there are still financial constraints for students when it comes to being able to respond to a text from a telecommunications provider that is not part of their pre-paid plan. In this study, students were not expected to respond to texts, however it is apparent they would have liked the opportunity to respond. This is a consideration that faculty may need to have when preparing budgets to support a mobile enhanced learning environment.

Students' responses to the open-ended questions and feedback from the focus groups also highlighted issues that educators need to pay attention to when using mobile technologies. The timing of when text messages are sent to students is essential, as it was revealed in this study that when students received texts during lecture time, distractions were experienced by the other

students and the lecturer. The ability to respond to texts was considered desirable by the students, however due to insufficient credit on their phones, they were unable to. Additionally, consistency in the use of the mobile tools was deemed important by students and as discussed in the previous section, students enjoyed the additional communication and interaction to the extent that they would have liked all of their lecturers to have communicated in the same way. The issues raised suggest that a consistent and planned approach by educators is needed when designing, planning and implementing a mobile enhanced learning environment, along with appropriate institutional financial support to allow students to take full advantage of the mobile tools being used.

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