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Prevailing Personal Social Communication Technologies Enhancing Engagement in Large Lectures: From Texting to Mobile Web Enabled Devices (0264)

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Introduction and Methodology

The aim of this paper is to present the next phase of an ongoing study into the use of Prevailing Personal Social Communication Technologies (PPSCTs) to enhance student engagement in large lectures, where PPSCTs are used to represent those technologies that the vast majority (95% or more) of the students in particular grown own personally and use for social communication (Nesbit & Martin, 2011).

The structure of the paper includes a brief description of the earlier phases of the study (Nesbit & Martin, 2010; Nesbit, 2012) that highlighted the feasibility and potential benefits of the use of PPSCTs in the form of a text-messaging based system to enhance student engagement in large lectures. This is then followed by the methodology, results and analysis for this phase of the study.

In this phase of the study a survey was conducted of students at the University of Canterbury (Christchurch, New Zealand) with the aim of measuring the changing patterns of device ownership and a further survey was conducted of students in a class where an application that runs on web enabled devices such as smart phones, tablets and laptop was used to enable to students to interact with the lecturer.

Summary of Prior Work

The previous work in Nesbit & Martin (2010) and Nesbit (2012) covered some of the literature relating to the use of technologies to enhance student engagement in large lectures to deal with the issues that surround interaction in large lectures (Draper & Brown, 2004) and covered a number of different technologies that can be used to do this including classroom response systems (CRSs) and clickers (Flies & Marshall, 2006; Scornavacca et al, 2007; Freeman & Blayney, 2005).

The initial phase of this study (Nesbit & Martin, 2010) described the initial development and use of a system that allowed students to text-message questions and answers to lecturers so that the lecturer could give feedback on what has been sent, and the next phase (Nesbit, 2012) described how the system was used extensively in another course and analysed the student perceptions about how it affected their interaction in lectures. The results from these phases of the study demonstrated that there was a very significant difference amongst the students surveyed regarding their level of engagement when texting responses compared to responding verbally. It was concluded from the earlier phases of the study that the use of the system was very successful in enhancing student engagement in large classes.

One of the ongoing issues with the text message based system that had been developed was that it was relatively difficult to one person to use the system and conduct a lecture at the same time. As a consequence there was a need to either re-develop aspects of the system or find an alternative system that was easier to use.

The use of the system did however overcome one of the issues that had been experienced when using clicker devices with the lecturer no longer having to book and bring the clicker devices to the classroom as the vast majority of the students owned a mobile phone that was capable of sending text messages. This latter aspect had been one of the drivers behind the coining of the PPSCT term.

Results and Analysis – Ownership of Web Enabled Mobile Devices

Across December 2012 and January 2013 a cross section of students at the University of Canterbury were surveyed regarding their changing ownership patterns of a range of devices from mobile phones that could be used for text messaging, through to smart phones, tablets and laptops.

The students were asked which of the devices shown in Figure DDD that they personally owned at the end of 2010, 2011 and 2012, with this also showing the number of students who indicated which devices they owned at the end of each year. The data shows significant increases in the ownership of the smart phones, tablets and laptops.

| Device | 2010 | 2011 | 2012 |
|---------------------|------|------|------|
| Text Capable Mobile | 225 | 231 | 231 |
| iPhone | 14 | 49 | 76 |
| Android Smart Phone | 26 | 61 | 97 |
| Windows Smart Phone | 8 | 8 | 10 |
| Laptop with Windows | 131 | 157 | 174 |
| Apple Laptop | 33 | 44 | 53 |
| Android Tablet | 2 | 6 | 9 |
| iPad | 4 | 22 | 45 |
| iPod Touch | 38 | 51 | 54 |
| Total | 237 | 237 | 237 |

Figure DDD – Changing Ownership Patterns of Devices 2010-2012

The responses were further analysed to combine together the smart phones, laptops and tablets into groups and to combine all mobile web enabled devices into one group, with these results of this analysis being shown in Figure EEE. Note that where students owned more than one of a type of device (for example more than one smart phone) they are recorded once only in this data.

| Device | 2010 | 2011 | 2012 |
|---------------------------|------|------|------|
| Text Capable Mobile | 225 | 231 | 231 |
| Smart Phone | 45 | 108 | 171 |
| Laptop (Windows or Apple) | 156 | 191 | 214 |
| Tablet | 44 | 75 | 92 |
| Mobile Web Enabled Device | 173 | 218 | 229 |
| Total | 237 | 237 | 237 |

Figure EEE – Device Ownership Grouped by Device Type

This analysis shows:

- ◆ An increase from 45 (19.0%) of students owning smart phones at the end of 2010 to 171 (72.1%)
- ◆ An increase from 156 (65.8%) of students owning laptops at the end of 2010 to 214 (90.2%)
- ◆ An increase from 44 (18.6%) of students owning tablets at the end of 2010 to 92 (38.8%)

When looking at the percentage that owned any form of mobile web enabled device (smart phone, laptop or tablet, the number of students owning at least one of them increased from 173 (73.0%) at the end of 2010 to 229 (96.6%) at the end of 2012. This is only marginally behind the number of students who owned text capable mobile phones at the end of 2012 (231 = 97.4%).

This suggests that moving the ongoing study from a text message platform to the use of a web application that can run on smart phones, laptops and tablets would be justified from the perspective of these mobile web enabled devices now appearing to be a PPSCT for a cross section of students.

Results and Analysis – Web Enabled Mobile Devices as PPSCTs – Initial Student Perceptions

There are a number of applications that have been developed for web enabled mobile devices that can be used to facilitate interaction between lecturers and students in large lectures. One such application is UCanAsk which was developed by final year computer science students at the University of Canterbury. During semester one of 2013 UCanAsk was used during a large first year commerce course. At the end of the course the students were surveyed and asked how frequently they would be likely to respond verbally or with the system in four different manners, with these being shown in Table QQ and being based on the survey used in Nesbit (2012).

| | |
|--|---|
| Interrupting the lecturer to ask a question | Using the system to ask the lecturer question |
| Answering a question asked by the lecturer | Using the system to answer a question asked by the lecturer |
| Telling the rest of the class what their group had talked about in a small group | Using the system to share what their group |

| | |
|------------|--|
| discussion | had talked about in a small group discussion |
|------------|--|

Table QQ – Manners of Participation

Of the 380 students enrolled in this course, 58 of the students responded to the survey for a response rate of 15.3%, and while this is a relatively small response rate, the responses do give some indication of the usefulness of UCanAsk for increasing student engagement during the lectures.

The comparison of how willing the students are to interrupt the lecturer to ask questions and how willing they are to use UCanAsk to ask questions of the lecturer is shown in Table RR. After inspecting the results it is clear that there is a significant difference in willingness to ask questions verbally and ask questions using the system.

| | Very Often | Often | Occasionally | Rarely | Never | Total |
|---|-------------------|--------------|---------------------|---------------|--------------|--------------|
| Interrupting the lecturer to ask a question | 0 | 1 | 12 | 13 | 32 | 58 |
| Using the system to ask the lecturer question | 25 | 16 | 8 | 6 | 3 | 58 |

Table RR – Frequency of Responses Comparing Verbally Asking Questions and Texting to Ask Questions

The comparison of how willing the students are to answer a question asked by the lecturer and how willing they are to use UCanAsk to send answers to questions asked by the lecturer is shown in Table SS. After inspecting the results it is clear that there is a significant difference in willingness to answer verbally and answer using the system.

| | Very Often | Often | Occasionally | Rarely | Never | Total |
|---|-------------------|--------------|---------------------|---------------|--------------|--------------|
| Answering a question asked by the lecturer | 0 | 3 | 4 | 13 | 38 | 58 |
| Using the system to answer a question asked by the lecturer | 9 | 13 | 10 | 11 | 15 | 58 |

Table SS – Frequency of Responses Comparing Verbally Answering Questions and Texting to Answering Questions

The comparison of how willing the students are to tell the rest of the class what was talked about in their small group discussion and how willing they are to send what their small group had talked about using UCanAsk is shown in Table TT. After inspecting the results it is clear that there is a significant difference in willingness to share what their group had talked about verbally and to share using the system.

| | Very Often | Often | Occasionally | Rarely | Never | Total |
|---|-------------------|--------------|---------------------|---------------|--------------|--------------|
| Telling the rest of the class what their group had talked about in a small group discussion | 1 | 8 | 14 | 14 | 21 | 58 |
| Using the system to share what their group had talked about in a small group discussion | 11 | 12 | 11 | 10 | 14 | 58 |

Table TT – Frequency of Responses Comparing Verbally and Texting the Results of Small Group Discussions

From the responses of those students who completed the survey it is clear that the use of the UCanAsk system (and potentially other similar systems), has a similar impact on the students willingness to engage as the text messaging system that was the basis of the earlier phases of the study (Nesbit & Martin, 2010; Nesbit, 2012).

Conclusions

From the results and analysis of this phase of the study, is clear that the move to mobile web enabled devices for the ongoing study is justified from two points of view. Firstly from the survey of a cross section of students that mobile web enabled devices such as smart phones, laptops and tablets are now a PPSCT for this group of students. Secondly from the point of view of students' willingness to use applications on mobile web enabled devices in the class that was surveyed, there appears to be a significant increase in student willingness to engage.

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