

2007

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Recommended Citation

Richardson, Joan and Lenarcic, John, "e-Inclusion Through Text Messaging: The Emergence of an Administrative Ecology Within an University Student Population Via The Use of a Mobile Academic Information Delivery System" (2007). *BLED 2007 Proceedings*. 12. <http://aisel.aisnet.org/bled2007/12>

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E-Inclusion through text messaging: The emergence of an administrative ecology within an university student population via the use of a mobile academic information delivery system

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Abstract

The investigation evaluated the impact of incorporating mobile technology and in particular the introduction of on-demand Short Messaging Service (SMS) – also known as text messaging - into the information exchange between universities and the students. The impact of the technology on the creation of a new mode of information exchange that augments the existing student learning experience was assessed. The pilot of the application used SMS mobile technology to improve student ‘on-demand’ access to information relating to their subject schedules and assessment performance and institutional provision of information to students. This innovative use of the emerging technology enabled ‘push-pull’ communication with the student body and provided a means of keeping pace with the marketplace and stakeholder demands in terms of communication mode.

Keywords: mobile phone, text messaging, E-Inclusion

1 Introduction

The constant touch of mobile communication is facilitating a rapid transformation in the way information is exchanged at both personal and commercial levels (Agar, 2003; Baron, 2005). The emergence of text messaging as the new natural dialect of the young is a case in point of a new technology fostering digital inclusion amongst the previously disenfranchised. For example, the University of Cincinnati (UC) in the USA has initiated a voluntary program that provides all new students with a free mobile telephone (Roach, 2006). UC intends on deploying this medium as a wireless conduit to distribute information about academic courses and other administrative matters.

A pilot study using SMS mobile technology to improve student 'on-demand' access to information relating to their subject schedules and assessment performance and institutional provision of information to students, was conducted at RMIT University in Australia. The software application was developed by Pearson Education Australia and Avidity Software Pty. Ltd and trialled in a large undergraduate subject in 2006. This innovative use of the emerging technology augmented 'push-pull' communication with the student body and provided a means of keeping pace with the marketplace and stakeholder demands in terms of communication mode.

Students were informed about the availability of the mobile technology during class and by means of Email. Registration into the system was on a voluntary basis during semester 2 of 2006. Surveys were constructed and conducted online to evaluate information quality and the effectiveness of the 'push-pull' SMS delivery undertaken. Student adoption of the application of the technology and the associated impact on university service provision to the student body was underpinned by the quality of the information provided as well as its timeliness. Whether the provision of 'just-in-time' information to the student body, 'on-demand', improves the students' transitional experience in the first year was investigated in a similar study undertaken at Kingston University and reported on by Stone (2004). The ability of the communication tool to assist in the creation of virtual community boundaries and social networks built in first year undergraduate classes was supported.

1.1 Rationale

Educational organisations have become global corporations providing a diverse range of products and services using a myriad of delivery models. Changes in the cultural environment that includes social usage of new mobile technologies have altered student expectations. "The learning area need not necessarily be enclosed within the school premises." (Stone, 2004)

Technology provides the means for students to take responsibility for their choices in relation to participation in the teaching and learning interaction. The application of the 'push-pull' SMS technology in the educational environment will assist students with their time management, self-organisation, information management and communication, all of which are critical work-ready skills. Marginson (1994) includes these 'interpersonal skills' as necessary capabilities for graduates in the workplace.

A pilot of the *Trigger* application at RMIT (2006) provided an opportunity to not only send time-sensitive information to students but also allowed them to access information on-demand. Students could control the 'who', 'why' and 'what' of the interaction and the 'where' was unimportant. According to Faulkner (2005) the ability to transmit and receive private information whilst in a public space is perceived as an advantage of mobile technology for youth. *Trigger* enabled students to acquire instantaneous responses to SMS triggers sent from their phones and to receive messages from their teachers. Barriers to communication imposed by the use of the Internet, Email and traditional phones were removed. Constraints imposed by traditional telephone conversations about assessment

submissions between academics and students like, “I tried to call you but you weren’t there so ...” (Reisman, 2006, p.62) have been removed by mobile technologies.

The *Trigger* application removed traditional geographic and time constraints and enabled students to access information relating to their subject lecture, tutorial and assessment schedules and results on-demand. Students requesting scheduling information were not accessing the academic but a database of information specifically generated for the subject. Using SMS to request University information meant that the *Trigger* application functions as if there was an invisible client on the student’s mobile phone despite the fact that no software was required on the student’s mobile phone.

Stone’s (2004) study at Kingston university in the UK identified SMS as a technology that students already used and this fact influenced the choice to utilise it, “to support first year degree students towards appropriate resources and procedures in a timely manner, to assist completion of assignments on a first semester module” (Stone, 2004, p.1). Information made available to students using the SMS learning management system at RMIT provided time-sensitive information that was also disseminated using Blackboard, the Internet, email and hardcopy. The information sent included –

- Reminders for deadlines for assessment;
- Time and location information about lectures and workshops;
- Time and location information about examinations and assessment tasks; and
- Assignment and exam marks.

Technology has caused a complication in the understanding and use of time “Newtonian or Absolute time ‘bent out of shape’ by local sociological factors,” (Marcus, 2004, p. 19). Information has to be available for access and delivery using a range of modes depending on the technology available to students at any point in time. SMS technology according to Faulkner (2005) reflects attributes of Email in that it is asynchronous and enables automatic reply without having to recall an address or phone number.

Adoption and use of the technology in the social and business arena for the purpose of communication is evidenced by “the 20.5 billion messages sent in the UK in 2003.” (Faulkner, 2005, p. 169) Innovative utilisation of available technologies such as the Internet and email has enabled Universities to respond to generation Y, fee paying student expectations driven by the marketplace. Students’ as clients are the change-drivers with reference to technology usage and changing expectations that indicate a need to provide immediate responses to questions asked and a shift towards mobile technologies.

According to a study by Markett (2006) 80% of students send an SMS every day “SMS has been called the ‘killer’ application of mobile phones, as its usage exceeded all expectations. Reasons contributing to the growth include low cost, asynchronous nature (users can reflect before sending and reply at their leisure), and potential for quiet/private use” (Markett, 2006, p282). Mobile phone

penetration of the student population is high and expected to remain that way. “In 2006, 950 million phones are expected to be sold in contrast to 234 million PC’s” (Arvind & Hicks, 2006, p78).

2 Evaluation of the pilot

Unlike Email the *Trigger* application does not enable academic to individual student discussions. The application is a predominantly student controlled SMS application which allows for student initiated requests of information to be served back to students instantly. For example students can send text “MY PROGRESS” to the Trigger application, to which the student will receive a response like “11.25% (with 75% of assessments still to be released)”. In the first instance the quality of the messages available in response to the triggers was evaluated. Students can then request the information described in Table 1: *Triggers and Sample Responses*.

SMS	Message
Text: <i>lectures</i>	<i>Demonstration - Database Management Systems Tue 10:30AM in Melbourne City Conference Centre - 333 Swantson St</i>
Text: <i>tutorials</i>	<i>Database - Designing for data Wed 01:30PM in 108.09.003</i>
Text: <i>next exam</i>	<i>End of Semester Exam conducted during the University Official Examination period Mon 12:00AM in TBA</i>
Text: <i>next assn</i>	<i>Presentation and Spreadsheet Assignment due Mon 12:00PM worth 25</i>
Text: <i>due this week</i>	<i>Assignment 1</i>
Text: <i>latest results</i>	98
Text: <i>my progress</i>	49

Table 1: Triggers and Sample Responses

The number of students using each trigger was counted and the questionnaire addressed the ‘usefulness’ and ‘effectiveness’ of each message. Although the information was available on-demand and sent to the individual requesting a response, academic interaction was not required in ‘real-time’. The application is not limited to on-demand, one-to-one information transactions. As Reisman (2006) highlighted an academic who Emails an entire class can sometimes receive multiple responses from individual students who respond to the message directed to the class groups as if it was a personal one-to-one interaction.

An academic course coordinator using the application, for example, could provide a ‘blast’ service and send assessment feedback and reminders to the entire student cohort when required. Messages sent to the students reminded them about assignment due dates and results availability. The survey asked the students how useful they found the information sent to them.

2.1 Survey Results

The initial pilot used a large undergraduate subject delivered to the entire business cohort of students to trial the application of SMS technology. The dataset

collected to evaluate the application of the technology was relatively small (25). However, the overwhelming positive response to the technology application provides a basis for additional testing to build on the dataset. Normal methods of information provision to the students were maintained throughout the pilot. Web based access to class timetabling, location and scheduling information, as well as assessment requirements was provided in addition to the SMS.

In the 2006 pilot students were informed about the application during lectures, by email and via Blackboard as well as being provided with *Trigger* control cards created by Pearson Education Australia. These cards enabled them to have ready access to the online registration address and possible text triggers at any time. At the end of the trial 180 students (which represented over half of the students) had voluntarily registered with *Trigger*. The survey conducted at the end of the trial indicated that 95% of respondents thought this information delivery process was effective.

Spikes in registration could be observed prior to release dates of assessment marks. This indicated that access to fast assessment results was a key driver for registration into the system. Word of mouth around the successful delivery of results for Assignment 1 in October and reminders to students that they would be receiving their results by means of SMS explains the late spike in registrations numbers prior to the November release of the final two assessment results. The relatively slow initial uptake of the system and poor survey response rate was mirrored in Stone's (2004) study findings at Kingston University. Figure 1: *Student Registration into Trigger* illustrates the timing of student uptake of the technology.

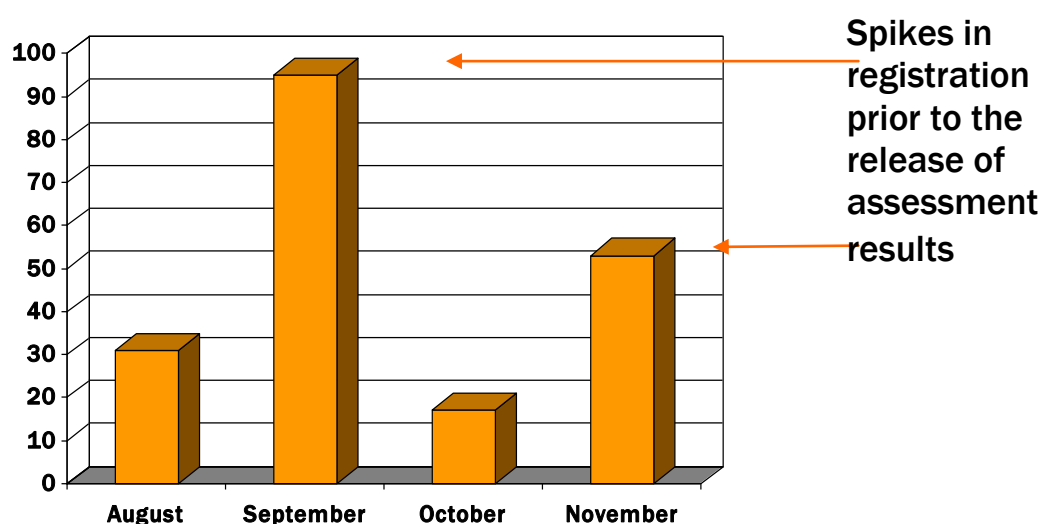


Figure 1: Student Registration into *Trigger*

Table 2: *Triggers Used in the Pilot* illustrates the recorded number of messages sent to *Trigger* by the students. As the application was only used for one subject rather than all of the subjects in which a student was enrolled it is postulated that some of the figures are lower than expected. It is anticipated that an increase in

the number of subjects incorporated in the trial and associated amount of information available using the Triggers will improve the rate of use.

Triggers	Trigger requests sent by students
Lectures -To receive the next lecture time, location, topic and required reading	106
Latest Results - To receive latest results	37
Results - Incorrect request	36
My Progress - To receive an update on how on percentage score towards final results	22
Next Assignment	10
Next Exam	3
Tutorials	8
Due this week	3
Due Next week	5

Table 2: Triggers Used in the Pilot

An online student survey was conducted at the end of the pilot demonstrated an overwhelming positive response to the use of the technology for assessment mark access. Figure 2: *Students’ Rating of the Effectiveness of SMS* demonstrates their perceptions in relation to assessment mark and scheduling delivery.

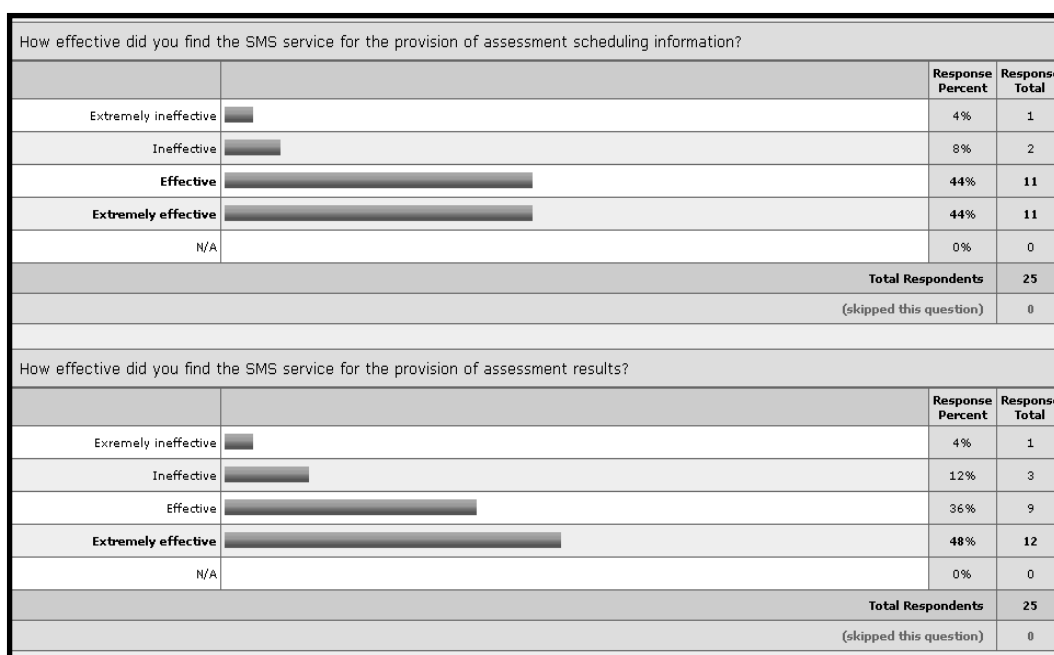


Figure 2: Students’ Rating of the Effectiveness of SMS

Although the response rate for the initial trial was disappointing the results affirmed findings identified in the literature and at other universities. The student cohort found the use of the technology useful as illustrated in Figure 3: *Students’ Perception of the Usefulness of SMS*.

7. How convenient was the ability to access assessment information anytime, anyplace?			
		Response Percent	Response Total
Very inconvenient		0%	0
Inconvenient		4%	1
Convenient		48%	12
Very convenient		48%	12
N/A		0%	0
Total Respondents			25
(skipped this question)			0
8. Did the system improve your ability to schedule assessment task work?			
		Response Percent	Response Total
Strongly disagree		4%	1
Disagree		24%	6
Agree		44%	11
Strongly agree		28%	7
N/A		0%	0
Total Respondents			25
(skipped this question)			0

Figure 3: Students' Perception of the Usefulness of SMS

The students' response to the survey also demonstrated a positive correlation between 'on-demand' access to lecture and tutorial location and topic information and their ability to attend classes. Further investigation is intended to enable the collection of a larger dataset.

3 Conclusion

The *Trigger* application demonstrates an innovative use of the technology in enhancing students learning experience. It enables organisations to support the students' capacity to manage their learning environment in an individual manner. Students were able to interact with the University remotely using mobile technology to obtain scheduling and assessment details on-demand.

This innovative application of the technology enabled students to access information, at minimal cost irrespective of geographical location using a limited vocabulary of requests. The application of SMS technology in conjunction with kiosks described in the Slack and Rowley (2002) study describes the relative price of the Internet access device as a factor in the design of mobile use systems. The information available to students was input using the Internet by staff. This application of the technology was seamless, having input modality that was familiar to the majority of end-users, mobile input was enabled and most importantly the mobile phone acted as a memory device for students.

This study also built on Huang's et al (2005) Kimono information kiosk and phone knowledge sharing system built and evaluated at the MIT and Nokia research centre. "The acquisition and exchange of data and information is designed to be as simple and efficient as possible, prompting the user for

decisions only when necessary, and exchanging only information that is determined to be relevant to the user.” (Huang, Pulli, Rudolph, 2005, p.142) The system piloted at RMIT University was ubiquitous in that once a student was registered the system recognised the individual and provided information tailored to be relevant to them, “Only information that is selected to be of interest is then transferred to a handset” (Huang et al, 2005, p.143). This system extended the use of the current Internet infrastructure and usage by enabling receipt of Internet based information on mobile phone devices on-demand. “Although no formal user studies have been completed, feedback is generally positive and lab members note that they find the information presented on the kiosk useful”. (Huang et al, 2005, p.143)

Survey data collected in the initial pilot combined with a literature survey indicated that the use of the technology in the sector would potentially improve student attendance at classes and would be adopted. Engagement of students can be assisted by the technology as it is a fast way to get important information about the students’ university life and workload without booting computers or logging into a Content Management System. The system enables dynamic information transfer with live updates and potentially allows students to better schedule and organise themselves. The cost to students is minimal as all that they require is a mobile phone. It is envisaged that this ubiquitous device will aid in suppressing any hint of the digital divide within student culture in terms of the open-access provision of administrative information.

Ecology is a term that commonly refers to a natural environment that is unspoiled by human intervention. Nature within this context is often viewed as an emergent system that is constrained by geographic locality and consists of a myriad of interrelationships between living entities that co-exist in a stable equilibrium regulated from within. In a metaphorical sense, it is hoped that an administrative ecology will evolve given student acceptance of the *Trigger* application. The end product is envisaged to be a sustainable, dynamic network for the interchange of organizational information of an academic nature, all made palatable by its communicative basis in the vernacular of the moment, namely text messaging. Through the process of inclusion via engagement, the ultimate architects of this system will be the student users themselves.

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