The blended discourse of SMS communication in a mobile student administration system

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The pilot implementation of a Short Messaging Service (SMS) system for student-academic staff administrative information exchange in a higher education environment is described. Assessment results and related alerts were broadcast to students and access was provided to information relating to their subject schedules and assessment performance. Both qualitative and quantitative data were collected during the pilot study using an online student survey with a basis in Davis's (1989, 1993) Technology Acceptance Model (TAM). A preliminary analysis of the data from focus groups for staff and student participants is outlined here. The pilot and subsequent review enabled an evaluation of the benefits of SMS in relation to supporting student services, specifically scheduling information and assessment feedback. Some of the sociolinguistic issues related to the usage of the system are discussed, these being findings derived from the focus groups.

Keywords: Short messaging service, SMS, mobile communication, blended discourse

Introduction

This paper examines the effectiveness of Short Messaging Service (SMS) technology used to remind students about assessment schedules in a higher education setting. Students voluntarily registered to communicate using SMS and staff broadcast information in this mode on a class basis. Assessment results and reminders were pushed to students. All messages sent using SMS technology contained information also disseminated to students using the learning management system Blackboard, the Internet, email and hardcopy handouts.

The 2008 pilot of the *Pearson's SMS Prototype Tool* utilised the SMS prototype in 6 courses and enabled dynamic two-way 'push-pull' information transfer. A restricted vocabulary of requests for information 'on-demand' enabled students to receive time-sensitive data such as assessment feedback, marks, class scheduling and location information updates at minimal cost, irrespective of geographical location. This paper discusses the qualitative data collected in focus groups conducted for staff and student participants. These gave some inkling as to the advantages and disadvantages of official administrative information exchange in the informal medium that is text messaging.

SMS mobile communication

In a terse cultural history of the contraption of the moment, Agar (2003) portrays the mobile phone as a facilitation tool instituting a state of "constant touch" to dominate between those connected in what has become a ubiquitous social network. To some the mobile phone has distorted itself into a fashion symbol representative of the modern impetus towards a global culture dependent on the barter of information via associations of trust (Katz & Sugiyama, 2006). They have become pervasive indispensable talismans to the masses that are vital to some as conduits for personal well-being due to the comfort that they facilitate via both emotional and aesthetic means. It is interesting to note that, the term "mobile phone" echoes the nomadic freedom possible with this liberating adornment of technology.

Computer-mediated forms of communication such as e-mail, instant messaging and texting have been observed as representing a stylistic evolution in natural language. Baron (2005) observed that e-mail was

evolving into a hybrid form of interpersonal communication that combined the structures of writing with the informality of speech. In Baron (2005) similar comments were advanced with respect to instant messaging, a technological cousin of text messaging. Nardi, Whittaker and Bradner (2000) talk of instant messaging providing a platform for both interaction, or simple information exchange, and "outeraction." The latter neologism being the social context within which the information is transacted.

Australian Mobile Market statistics indicate that Australians sent over eight billion SMS messages in the 2005/6 financial year, an average of at least 300 messages for each subscriber. This usage has exceeded expectations primarily due to the low cost of messages and acceptance in the youth culture as a means of scheduling social events. Reminders and the sense of control provided by the asynchronous nature of the communication mode enable users to reflect before sending a reply at their leisure.

Previous studies completed by Naismith (2003), Stone (2004) and Harley & Winn & Pemberton & Wilcox (2007) have investigated integrating SMS in the higher education sector to primarily '*push*' information to students. Harley & Winn & Pemberton & Wilcox (2007) also argued that text messages can assist in the transition process for new undergraduates, building on work by earlier researchers such as Riordan & Traxler (2005) who also extolled its benefits in augmenting student support, inclusion and retention. Harley & Winn & Pemberton & Wilcox (2007) documented a system called *Student Messenger* that permits staff to send text messages from their desktop computers to the mobile phones of students. However, the setup does not facilitate two-way communication. A similar system known as *StudyLink* (Naismith, 2007) is an e-mail-to-text delivery platform for student administration usage. This too lacked the capacity for true bi-directional interactions, an attribute built into the *TriggerThat* prototype.

The project–based methodology supported fast development of the technology prototype *TriggerThat* which had been specifically designed to improve student administrative services. Students voluntarily registered to communicate using SMS and staff input accessible information, via the Web. A restricted vocabulary of requests for information 'on-demand' enabled students to access time-sensitive data such as assessment feedback, marks, class scheduling and location information updates at minimal cost, irrespective of geographical location. Assessment results and reminders were also pushed to students by academics using the Web-based blast service. All messages sent using SMS technology contained information also disseminated to students using Blackboard, the Internet, and email and hardcopy handouts. Student access to information was restricted by what the academics input to the database and the six available *Trigger* words embedded in the system.

Learning environments of both an implicit and explicit nature do not only exist within the bricks-and-mortar confines of traditional schools (e.g. Stone, 2004). The efficient implementation of mobile technology in the higher education sector supports improved student mobility, development of a global skill set and improved relationship networks within the community. Students in such a pedagogic mobile framework are not isolated learners but part of a linked network with the potential to span the globe. SMS reminders to complete teacher directed activities utilising existing resources associated with texts outside traditional classrooms may improve uptake of available resources. (Richardson & Lenarcic, 2007). Currently a major problem for resource construction and delivery, using technology is the-re-integration of the learning narrative despite technologically supported deliveries in an environment where the boundaries of the traditional classroom have been removed. Re-building the storey is vital to produce students that are technically proficient within their discipline and able to effectively share and integrate discipline-specific knowledge (Corsini & Crittenden & Keeley & Trompter & Viechnicki, 2000; Wheeler, 1998).

Why SMS?

Products are often designed to be easy to use, but perhaps sometimes they may become too easy to use in which case their utility in application is almost an unconscious process for the consumer. This is certainly not the case with text messaging, given the obvious systemic constraint of 160 characters, being the maximum size of a single communication. On a pan-cultural basis, humanity is said to share the common trait of possessing a "puzzle instinct" (Danesi, 2002), an innate propensity to grapple with problems or enigmas that challenge ingenuity. The puzzle of text messaging is an ongoing challenge to craft miniscule missives, malformed in appearance perhaps, but with cohesive meaning that at times may appear to border on lyrical composition. (Minami and McCabe, 1991).

Universities, publishers and authors have invested heavily in the development of suites of resources that use a range of new technologies to augment learning in traditional educational environments, homes, workplaces and more recently in transit among these diverse settings. A profound gap has emerged

between the expected improvements to learning and teaching expected when technology is used and the real impact (Head, 2008). How to install and use the technology is not difficult as institutions have technology services staff and students are adept at Googling to enable cutting and pasting, defining terms using Wikipedia, entertaining themselves with content from YouTube, iTunes and MySpace and scheduling their life using SMS before they enter university (Head, 2008). How to remind students using technology to increase the uptake of curriculum resources outside the traditional classroom is at the centre of the problem for academics. A simple and direct method for advising students of services available, suitable delivery modes and a sensible order for undertaking learning activities is a necessary but complex task due to technologies' removal of boundaries around learning environments (Stone, 2004).

The type of communication for the digital native generation would appear to favour short and simple messages: – urgent SMS alerts, as mentioned earlier, seem very suitable. *TriggerThat's* functionality reminds and alerts students about work requirements to be completed outside class time and also utilises the ability of mobile services to free people from committing to physical presence and commitment to a pre-determined schedule in order to be accessible to another (McClatchey, 2006).

A social impetus for mobile phone use in higher education

The application of SMS technology to students' requests for the provision of administrative assistance and assessment results has the potential design software prototypes underpinned with knowledge of the customer drawn from existing databases and interactions. Once a student is registered the system recognises the individual and provides information tailored to them and the transaction can appear to be as personal as a natural conversation, albeit in the dialect of text. This design approach aspires to the notion of exploiting the potentially seductive qualities in an interface that entice the user through the power of persuasion (Khaslavsky & Shedroff, 1999), without creating new fragmented or marginally integrated systems.

Project description: The *TriggerThat* system

The prototype trialled enabled students to acquire instantaneous access to information by sending SMS messages from their phones. This represented a reversal of the standard communication channel from staff or university to student. However, academics were also able to send or blast students using SMS. If a scheduled class was cancelled staff could notify the student group before they attended the class and were inconvenienced. Barriers to student and staff interactions imposed by geography, time and memory were removed and students' access to information relating to their subject, lecture, tutorial and assessment schedules and results was on-demand.

During the project students were informed about *TriggerThat* during lectures, by email, via Blackboard and were given 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. These wallet-sized paper cards contained samples of responses that enabled the students to have an abbreviated ready access lexicon to the online registration address and reminders of the possible text triggers at any time. Students were given the opportunity to trial the SMS prototype to receive reminders and alerts. To register they provided their student number, password, Email, subject, lecture times, tutorial class and most importantly their mobile phone number. For one semester registered students were pushed reminders and results given access to schedules and assessment requirements. At the end of the specified semester the transient database containing class and student information was removed.

The academic course coordinators using the prototype, could also provide a broadcast message service and send assessment feedback and reminders to the entire student cohort when required. Consider instructor-initiated e-mails to an entire class. Often some students misunderstand that the e-mail was simply a mass mailing about some class issue, and not a personal e-mail to them from the instructor. If a student feels that an instant response is a necessity for an administrative query then text messaging might be a suitable delivery mode. Reisman (2006) noted that instant messaging is a medium that demands quick responses from participants. It is argued here that text messaging is analogous in this respect and consequently ideal for impulsive consumers seeking immediate information interchange where brevity is the aim. Academics who wanted to remind students about a weekly assessment task or provide a link to a media item that added to the learning and teaching resources available had to construct short messages to be sent to the students using SMS. Staff typed messages into a text box on the academic web interface displayed in Figure 1.

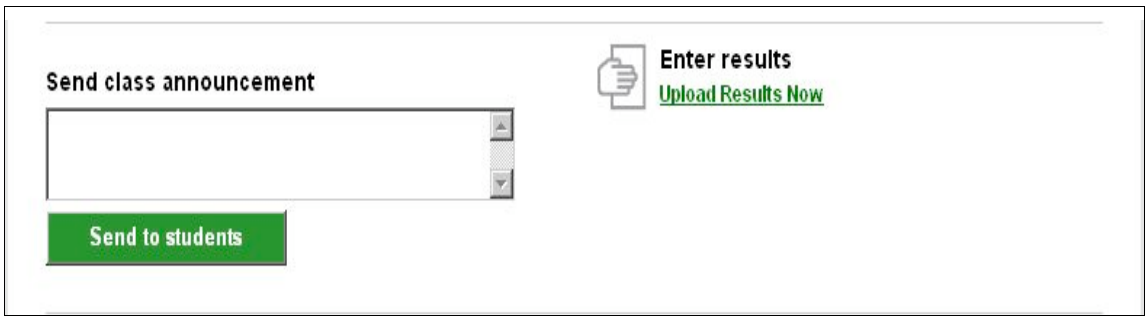

Figure 1: Academics '*push*' information to the student cohort

Academics who wanted to remind students about a weekly assessment task or provide a link to a media item that added to the learning and teaching resources available had to construct short messages to be sent to the students using SMS. Assistance was provided to the academics involved where required to upload course details and assignment marks (Excel.csv files) for SMS publication. During semester 1 the academic functional use was reasonably undirected, however business system constraints around the number of messages to be sent were imposed on a selection of the courses to enable comparisons. An understanding of appropriate SMS use and prevention of over-use also underpinned the decisions in relation to SMS broadcasts by academics.

In semester 2 the academic capacity to broadcast SMS message to students was not constrained. Academics had been found to be tentative with the technology use and required training, encouragement and assistance rather than constraints. Suggested messages, schedules for sending and associated purposes for SMS usage were generated after negotiation between four subject coordinators and the Bachelor of Business Information Systems (BBIS) Work Integrated Learning (WIL) student employed by the research project. The fourth year student involved in the project provide assistance when academics were uploading information for student access using the Trigger words and when they were preparing assessment reminders and alerts.

SMS technology usage has increased the number of transmission channels between university administration and students and in the process has subtly altered existing associated relationships. The culture of texting by accident would seem to belong to the student cohort but is now being borrowed by the higher education establishment for its utilitarian goals. Thus the student customers can feel that the university is conversing with them on their own terms, at least with respect to the mode of communication involved for transactions. Some might argue that the introduction of new technologies that are originally perceived to be for the greater good at times do not actually result in positive consequences due to the user impressions of a loss of personal control (Compeau & Higgens & Huff, 1999).

The *information quality* in relation to the academic SMS broadcasts was surveyed. In order for the technology to be effective the language used for the Triggers was designed to facilitate easy transfer from their social involvement with the technology. 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.

Norman (2007) advocates interfaces that allow a robust diversity of use, while maintaining some of the implicit flexibility of a *natural language*. Modern command or search languages represent a step forward to a new user-centric command line interface (Raskin, 2007). With its relaxed spotlight on concision, text messaging is a conversational interface to systems applications. Its appearance as the cyber-slang of the prevailing generation inadvertently corresponds to the recent opinion that the same cohort is developing an aversion to meticulous reading (Crain, 2007).

Research methodology

A project based methodology was used to scope, develop, prototype, test, and review in order to establish proof of concept. The methodology supported fast development of the technology prototype in conjunction with the identification of innovative uses of mobile technologies and a holistic and rigorous evaluation of 'best-practice' usage of applications specifically designed for the higher education sector. Qualitative data was collected during staff and student focus groups. Academics using the system

participated in a focus group to obtain their opinions with respect to the effectiveness and usefulness of the technology application

This project enabled the delivery of administrative scheduling and assessment feedback via SMS. During 2008 the SMS communications application was trialled in 9 course deliveries. The existing *TriggerThat* prototype was extended to manage 6 subjects across three Faculties in the 2008 pilot. Partners were involved throughout the project to determine requisite additions and deletions to the application that represented improvements to the quality of the information available.

Students' perceptions of the usefulness and relevance of each Trigger available was surveyed.

Focus groups

Academic staff had used the *TriggerThat* system primarily to issue mass broadcast reminders for assessment due dates and send results to students. Staff volunteered to participate in order to push reminders and provide 'on-demand' access of logistical information to students. Students had volunteered to receive and access SMS communications. Focus groups were conducted at the end of semester 1 and 2 to collect qualitative information from academic course coordinators that had been involved in the trial. This part of the process was designed to enable collection of data that detailed unplanned useful technical applications and functionality. Data collected in semester 1 was used to inform improvements to the business system, research design and SMS prototype in semester 2.

The investigation was designed to establish the social consequences of using the Trigger system, strengths and weaknesses in the existing system and unplanned useful functionalities. The questions addressed by staff and students were:

- What does *TriggerThat* do to empower the system user in their sense of control over transactions?
- What does *TriggerThat* do to fortify the identity of the system user within the university culture and ensure respect-laden transactions?
- What does *TriggerThat* do to foster a sense of belonging amongst system users and assist in managing fragmented lives?
- What did you use the application for?

Academic descriptions of useful functionality

The results of the pilot conducted in 2008 were examined through the lens of unexpected results obtained from stakeholder participants during the focus group. Participants were asked to identify the features and functionality of the initial design of *TriggerThat* that were useful. Academics remarked that:

1. "A text message might cajole students to look at longer electronic messages that he suspects they don't read." Currently, this academic respondent adds resources to the web-based distributed learning system during the semester. Some of the materials designed to augment student learning are poorly utilised, even though students are aware of their existence. Academics utilised *TriggerThat* to alert students to resources available on the Online Learning Hub and ready for download to devices like iPods. (Students did not find this useful).

2. Staff participating in the *TriggerThat* pilot suggested that a potential use for SMS may be to nag students about lengthy reading tasks required outside traditional classroom boundaries that are currently poorly done. (Students did not find this useful).

3. Academics requested assistance with the translation of normal language to txtspk. This was trialled in semester 2. The student reaction to txtspk was not entirely favourable.

4. Academics initially reluctant to message.

5. The limited supply of 160 characters that constitute the expanse of a single text message compels the author of such a message to adopt a strategy in order to relate cogent meaning and this becomes a shared approach to generate a dynamic mobile social network. The need for change in the communication mode prompted academics involved in the *TriggerThat* pilot to request training and samples of useful SMS They requested:
    a. A list of easily accessible sample messages for reference.
    b. Suggested timing of messages of particular types (Students agreed).

c. Explanation of the conceptualisation of the new communication paradigm and associated functions.
d. Reminders, directions to extra resources available, help sessions.
e. Requested a third party send messages?

Academic descriptions of difficulties

The business system put in place to support *TriggerThat* required staff upload course schedule information already input into the course guide system and the Online Learning Hub to enable student access via SMS which increases duplication of staff effort. Work practice changes for *TriggerThat* operation were minimal as staff were required to access the course web page illustrated in Figure 1: Academics '*push'* Information to the Student Cohort and type a message. However, keeping the message within the 160 character SMS word limit required an alteration to standard message construction compared to email and some training. Constraints were built into the pre-trial briefing and training for staff in semester 1 to restrict the use of the technology. This was intended to prevent channel overuse as patterns of use have been observed in relation to technologies like email where messages become the dominant communication style which results in spiralling costs, information overload and narrative fragmentation.

During Semester 1, Phase 1 of the project staff sent messages using the Web based broadcast functionality. Use of the feature was minimal at the start of semester due to lack of familiarity with the application interface, functionality and SMS language constraints. A tendency to construct SMS in the same manner as standard emails sent to student course groups using the list facility of GroupWise. A large proportion of these messages exceeded the character limit of SMS and consequently produced error messages. A focus group held for staff at the end of semester 1 enabled staff to describe problems encountered and suggest solutions. In semester 2 the following actions were undertaken:

- A Work Integrated Learning (WIL) student was trained to provide a staff technical support role.
- Individual training sessions were provided by a (BBIS) of Business Information Systems WIL student
- All staff were assisted with information input tasks required to provide data for student SMS access.
- Staff recorded messages to be sent by week in an Excel template.
- Messages were classified by type:
  1 = Reminder (Assignment and test dates).
  2 = Alerts (Extra material added to the DLS, multimedia, ipod downloads and special events).
  3 = Assessment (marks).
  4 = Class changes.
- Messages were translated into TXT SPK

Table 1: Types of text messages sent and samples

Message Type	Business Computing 1	Computer Foundations	INTE2109 WIL	Translated Text Message
Reminder	2	9	15	ISYS2056 - Ass1 due @ wokshps nxt wek (Wek 6)
				Wk 8 Lctre 2nite - 5.30pm - n't lse ur lctre prticpatn mark
				Bring WIL2 Report Draft to WIL Seminar
Alert	16	0	0	ISYS2056 - Spcial Ass1 Help Sess cont - c DLS 4 dtails
Assessment	2	0	0	ISYS2056 - Ass1 rslt wil b avble on SMS @ d strt of Wek9
Class Change	1	0	0	ISYS2056 - Gst Letr Dr Joan Richardson this wek - b der!

Some academics participating in the focus groups at the end of semester 1 cited a lack of familiarity with the language commonly used by students as a constraint to use of the SMS application for broadcasting to their student groups. In order to remove this constraint to trialling of the application a WIL BBIS WIL student translated, recorded and sent SMS messages in semester 2. Standard sentences, such as, "ISYS2056 - To revise for the exam start now doing the Sample Exam Question on DLS each week"

were changed to "ISYS2056 - 2 rvse 4 d exm start nw doin d Smple Exm Ques on DLS ech wek". This practice was designed to encourage staff to use SMS rather than email. However, the student response provided in the focus groups at the end of semester 2 was unexpected. First as the message was sent in Week 3 (August 4) of semester it was not considered a reminder but nagging and secondly, a group of students not exhibiting common attributes like age, gender or nationality commented that the translated messages were difficult to decipher. A cohort of the students requested that SMS messages utilise proper English. Table 1 displays the number of each type of message sent in 3 courses in semester 2.

Student descriptions of useful functionality and difficulties

Students volunteered to participate in the trial and to provide their perceptions of the effectiveness and usefulness of the 'push' and 'pull' SMS functionality. A focus group was conducted at the end of semester 2 to collect qualitative information from *TriggerThat* registered students. This part of the process was designed to enable collection of recommendations for improvements to the SMS functionality and business systems. A summary of key comments is listed below.

> "Generally, I like the SMS system very much, it helps a lot, and it really helps as a reminder to help me remember the due date and the classroom. But sometimes it is a little bit hard for me to read the message, *too much abbreviations*." Three out of the eight students attending the focus group commented on the messages translated to 'text speak' being hard to decipher. Best practice requires the use of SMS only where the message is short and required in a timely manner off-site.
>
> *Assessment schedules and feedback are reminders*. Messages that remind students to study for an exam in week 2 are really 'nagging' - This perception of *TriggerThat* as a kind of electronic "conscience" can be construed as an innovation of the existing system albeit unintended.
>
> "*Push* or send me *results* rather than me sending a message". This statement was reinforced by the record of the number of messages sent and the students' evaluation of assessment details 'pushed' and 'pulled'.
>
> "DLS *alerts are unnecessary* and it is pointless to send an SMS as well." Reminders about assessment were stipulated as useful unless they were "Reminders to start studying for an exam in September which are not necessary" and "Getting reminded about extra work (to poke your conscience) is nagging."
>
> Reminders close to the *exam* of the date and *seat allocation* were thought to be useful, as were assessment dates and feedback. However reminders for tutorial dates were not considered necessary.
>
> SMS for *all courses* would be good.
>
> Lecture locations only useful at the start of semester
>
> SMS to book time with teachers and lecture location changes would be good
>
> Useful for *library due dates*
>
> "I have 1000 unread emails but no SMS". Some emails are not read but *all SMS are read* There is no equivalent of SPAM yet
>
> Students *prefer SMS* for assessment details rather than finding the information in *the web* based course guide.
>
> Could a *"help"* facility be added to remind students of the Trigger words
>
> SMS would be more useful for courses where there is *assessment occurring each week* eg. Macroeconomics or Business Statistics both first year common core subjects

Conclusion

The pilot described in this paper reviewed the use of SMS technology in a higher education institution. *TriggerThat* was a prototype developed to communicate administrative details, such as, assessment and teaching schedules to students using SMS. The design difficulties related to aligning SMS technology features and functional usage. During review of the pilot whether targeted SMS use improved the

students' learning experience, by means of streamlining administrative services and enabling immediate communications from academics and the institution was questioned. As the student response to the limited technology use was positive further development and trials were recommended. It was clear that students' wanted to be reminded about assessment requirements outside the boundaries of the traditional classroom using SMS. Students' were also prepared to pay for SMS to access assessment feedback data using SMS. However, the value-add of improving communication between academics and students, to the educational learning environment was not clearly articulated by focus group attendees.

Cultural shifts and social understandings of technology usage applications like *TriggerThat* demand further investigation in the higher education context as students' do not need to be trained to use SMS they already do. To them it has become perhaps not a complete language but a generational register. The latter term in sociolinguistics refers to a variant of natural language employed in a particular social setting (Halliday, 1978). SMS is often a register that facilitates informal communication. It is interesting to note from the academic focus group comments that SMS to this cohort appears to be a code rather than an informal register. This was deemed to be the case because it was suggested that a list of commonly used text messages should be assembled for selection when academic staff use *TriggerThat*. The informal register that is SMS would allow creativity even in the composition of administrative text messages, however if it is perceived as a code then such users would feel more secure with a standardised list of message options.

This project aimed to find out what they would use it for in an educational setting and whether there was an educational advantage to providing the functionality as an adjunct to the existing plethora of applications available. An issue that needs to be explored in future research is whether an informal register such as SMS can serve as channel for more formal communications dealing administrative matters in an academic environment. Comments from the focus groups alluded to the possibility that some students may have found it difficult to decipher Trigger messages because their formal intent conflicted with the informal usage expectations of the text messaging medium per se. The real value of the technology lies in broadcasting students with simple information that saves staff time in answering common questions. The identification of what information would provide staff costing reductions would require an analysis of 'Frequently Asked Questions' on the web and a cross map of these against Service Point data in all Colleges to identify the most important details.

Alerts and reminders are amongst the many uses for SMS technology suggested in current research (Traxler, 2005) 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. Staff can remind students about assessments and alert them to useful topical events available using other technologies for download. Graduates require the capability to choose appropriate technologies for varying types of communication. The acquisition of knowledge about SMS gained through practical use complements common social involvement with the technology should be easily transferred to whichever business context and profession students' enter. Development of self-organisation, information management and critical work-ready skills are driven by the functions involved in the technology system.

One of the comments from the student focus group indicated that e-mail messages, because of their bulk in number, were often easier to ignore than text messages. This could also imply that the personal social networks that are established through the usage of mobile phones have some upper limit in their size before communication transactions therein induce information overload. Dunbar (1992) speculated that an approximate value of 150 is the upper cognitive limit to the number of individuals with whom a single person can sustain committed social relationships. This could be investigated in future research as a target limit for the optimum size of *TriggerThat* communities where administrative communications would blend in with the informal exchanges of de facto mobile social network of students and academics.

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