Chapter 13

Short Message Services for Supporting Student Learning:
A Blended Approach

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ABSTRACT

This chapter discusses the blending of anonymous short message services (SMS) with a learning management system (LMS) to support non-traditional postgraduate learners in a block release programme at a higher education institution. The personal ownership of the mobile phone, coupled with its consistent presence and connectivity, was enhanced through the provision of anonymous communication via SMS. The seamless integration allowed for optimal use by learners who had limited access to the LMS but greater access to the mobile device. The mobile phone enhanced with anonymity created a safe learning environment based on andragogical principles. The postgraduate programme made extensive use of the learning management system (LMS). In block release programmes, learners may be distributed in developing countries and have one contact week per module. During both pre and post-contact sessions, learners are located in contexts where mobile connectivity is more guaranteed than Internet access. Most resources are downloaded during the contact week for reading offline. As learners interact with resources they engage in internal dialogue and mobile phones can facilitate a way to artefact internal dialogues through blogging. The use of anonymous communication using SMS creates a safe and equal socially networked knowledge production environment.

INTRODUCTION

Blended learning is an integration (not a layering of one on top of the other) of face-to-face and online learning experiences (Garrison & Kanuka, 2004).

It is the combination of conventional teaching approaches and e-learning elements within a single course or programme (Littlejohn & Pegler, 2007).

Among other reasons, the increasing popularity of blended learning can be attributed to the manner in which it opens up educational opportunities to people excluded from accessing

education. These exclusions are often due to an inflexible academic calendar or time constraints affecting attendance at full-time contact sessions. Ross and Gage (2006) pointed out that combining course and curriculum design with blended models (e.g., technology-supported courses, alternating face-to-face and online class meetings, videoconferencing to multiple class sites, or use of webcams) could increase the number of student enrolments in university programmes. While a focus on increasing enrolment numbers is desirable, the additional challenge of ensuring that learners successfully complete their study programmes within the prescribed time frame has to be considered. These issues and challenges require rethinking both the provision of learner support and design of learning activities in blended programmes particularly in cases where learners are distributed in developing countries that has limited access to Internet but have ubiquitous access to mobile networks. Without Internet access the educational affordances of blended learning cannot be realized. However, mobile learning is providing a new learning experience that is neither face-to-face nor online and is potentially changing the traditional notions of contact education.

The notion of contact education, as opposed to distance education, presupposes increased face-to-face interaction between learners and educators. Traditionally, attendance at a contact learning institution demands that learners physically attend prescribed and pre-registered courses in allocated buildings at specified times. This suggests that traditional contact education is defined in terms of purpose, time, space and distance. The purpose is the underlying agenda set for a particular meeting for example a seminar on teaching with Twitter to be held on Friday 19 November at 12h45-14h00 in the Centre for Educational Technology meeting room. The purpose, date, time and venue are set in advance and the attendees notified. The people go to attend meetings/seminars and meetings/seminars do not go to the people. Contact education is often inflexible,

a person can only be at one meeting at a time, a venue can only hold one meeting at a time, and failure to converge and synchronize the date, time and venue could result in a person missing the event. Any change to purpose, date, time and venue needs to be communicated in advance. It is at the convergence of purpose, time, space and distance that face-to-face interaction happens in contact education. Whereas a blended approach based on an integration of mobile phones with LMS seeks to provide flexibility on purpose, time, space and distance. The teaching and learning challenges of non-traditional learners enrolling at a traditional contact institution cannot be addressed using traditional teaching approaches.

In this chapter, non-traditional learners, defined as adult learners not straight from undergraduate degree, who juggle work, family, and education. For these learners work and family is so imbedded that it is not practical to take leave from either to focus on education. These learners work and study full-time and have family responsibilities. Since 2007, the author has convened a postgraduate programme in Educational Technology for non-traditional learners at a contact institution. The programme, which attracts diverse international learners, makes extensive use of a learning management system (LMS) with high differentials of access but all learners had mobile phones for which educational uses were extremely minimal. It was this background that created opportunities to explore ways of blending anonymous short message services (SMS) with LMS to support non-traditional postgraduate learners. Mobile learning has potential to not only enable seamless learning across contexts, but also to mitigate some of the pedagogical challenges of blended courses through its ability to blend formal and informal learning as well as ubiquitous and institutional technologies. This argument is premised on the fact that nearly all students, regardless of their country of residence, either own a mobile phone or have access to one. Henschke (2010) observed that one of the challenges facing higher educa-

tion institutions in the 21st century is serving the educational needs of a non-traditional population (older than the traditional college age of 18-22) that requires different approaches for fulfilling their educational needs.

In the next section, the educational context in terms of the contact institution, the programme students enrolled in, and the background of learners is described.

EDUCATIONAL CONTEXT

The University of Cape Town (UCT) is a research-led contact university located in Cape Town South Africa. UCT is recognized internationally as Africa's leading research university with more than 21000 students, of which 15000 are undergraduates, 6000 postgraduates and 4000 international students. The university has learners from diverse socio-economic and historical backgrounds with varying degrees of preparedness prior to enrolling to the university. The learning management system, Sakai (locally branded as Vula) was deployed at UCT in 2006. Vula is supported and maintained by the Centre for Educational Technologies (CET) located in the Centre for Higher Education Development (CHED). Vula has an email help desk that supports both staff and students.

The postgraduate programme, co-convened by the School of Education, in the Faculty of Humanities and CET, is geared specifically at people who work, who are intending to move into a work setting where technology is used for teaching and learning. The target market is not limited to educators, but also to those at the fringes of the discipline of Education. The programme also attracts learners with an interest in technical IT skills that work with the end user aspects of software design and the human-machine interface. Such people may already be designing educational software and would be interested in learning about what underlies effective engagement within a software domain. Thus, the programme is aimed at non-traditional learners. While the current offerings in the School of Education specifically target educators in general, this programme is for those who have a specific interest in learning/teaching with ICTs. In order to meet the varying needs of potential learners, prospective learners may enroll for a one-year postgraduate diploma in education (PGDE), which also serves as masters' course work. The second part of the masters' programme involves writing a proposal and conducting an independent study leading to a minor dissertation.

In the last three years (2008, 2009 and 2010), the programme enrolled students from South Africa, Congo DRC, Botswana, Sudan, Zimbabwe, Zambia, Malawi, Nigeria, Mozambique, Uganda and Kenya. The students not only come from geographically diverse countries but also have varied access to Internet and bandwidth. Although reading materials and assignments were delivered via a LMS, lack of bandwidth and intermittent access experienced by some learners made this delivery mode less than ideal. For example, most non-traditional learners work during the week and conduct their studies on the weekend. However access to certain university systems over weekends can be problematic since the ICTS helpdesk only operates during working hours or the server could experience problems over the weekend resulting in limited or unavailable Internet access. These challenges call for a rethink on the realistic delivery modes especially when learners are distributed and technological access is unpredictable.

The challenge therefore lies in how to manage and meet learner expectations driven by diverse reasons for which non-traditional students decide to pursue studies.

LEARNING NEEDS

At the start of the first module, students were assigned a preliminary task to introduce themselves and to explain why they decided to enrol on the programme. The latter was particularly important

for gauging student's educational needs. Below are statements from seven of the sixteen learners. The seven statements are chosen because they represent the diversity in the intentions that learners had for undertaking to study.

Student 1: …I chose this course because I am very interested in trying to understand how people use technology and to discover how ICT is used / can be used in the context of education.

Student 2: …I am interested particularly in the psychology of learning in an e-environment and the pedagogy and learner psychosis in an e-learning environment.

Student 3: …I'm interested in finding out why multimedia students - who help create the web - don't use it for learning.

Student 4: …to help sharpen my skills to effectively participate in the on-going e-learning debates that is confronting the Gauteng/ National Department of Education and the rest of the African continent.

Student 5: …I will be fully equipped to teach my colleagues and my subordinates what I have learnt especially as regards the application of technology in processing information.

Student 6: …I would like to apply learned techniques and knowledge to contribute to the development and implementation of ICTs in the education sector.

Student 7: ...I hope that this course will answer most of my questions about online course design, when to use e-learning alone in a course, when to use both and when to use face – to – face method.

The learning needs ascertained from the responses above suggest that students were intentional and had specific learning objectives for enrolling in the programme. These expressions of intent are informed by experience and embedded in context. Ensuring that each student achieved his or her learning intentions was just as important as

achieving the learning outcomes of specific modules. This suggests a need for a balance between the autonomy of an adult learner and the teaching to award qualifications. One way of addressing this challenge was to ensure that students created evidence of learning by critically reflecting and maintaining a record of their reflection (artefact).

ARTEFACTING INTERNAL DIALOGUE

While andragogy is premised on increased open learner-educator dialogue, it does not take into account internal dialogue. According to Merriam (2001) andragogy describes the adult learner as someone who (1) has an independent self-concept and who can direct his or her own learning, (2) has accumulated a reservoir of life experiences that is a rich resource for learning, (3) has learning needs closely related to changing social roles, (4) is problem-centered and interested in immediate application of knowledge, and (5) is motivated to learn by internal rather than external factors. It therefore follows that self-directed learning is key in adult learning. However, when the adult learners enroll at traditional institutions, self-directed learning becomes a means to an end as they are expected to follows a pre-defined curriculum with pre-defined learning outcomes. One of the challenges of teaching adult learners in traditional learning settings is the potential for issues of power and control in the class. This is particularly evident when the class is composed of learners holding high and key positions in organizations. These issues of power and control in class tends to have a silencing effect on some voices and a privileging of dominate voices hence making uneven the production of knowledge through unbalanced class participation.

In andragogy, learners rather than a teacher take responsibility for making decisions about what, how, when learning happens and for assessing the extent to which learning has happened. It is

in the decision making process that internal dialogue happens. Access to internal dialogue would provide a window to the kind of learning that is taking place and how it can be scaffolded without interfering with self-directed learning. There is therefore a need to create spaces where internal dialogue can be produced as artefacts thereby creating a learning resource based on plethora of internal dialogue. The challenge however, is that an environment for thinking-aloud needs to be safe for adult learners. To this end, anonymity could be used to provide this safety. Anonymity is employed here cautiously, as an effective learning environment need to provide anonymity confined within the bounds of a class. In other words, although anonymous, a user knows that a posting is from a member of the same class but would not know which member sent the message. It follows that adult learners can be empowered to reflect on the meaning making process of their learning, receive feedback on artefacts of internal dialogue without feeling vulnerable and get stimulated to continue learning. Henschke (2010) identified seven key factors in learning programmes that stimulated adult development:

- An environment where students feel safe and supported, where individual needs and uniqueness are honoured, and where abilities and life achievements are acknowledged and respected.
- An environment that fosters intellectual freedom and encourages experimentation and creativity.
- An environment where a faculty treats adult students as peers - where they are accepted and respected as intelligent experienced adults, whose opinions are listened to, honored, and appreciated.
- Self-directed learning, where students take responsibility for their own learning.
- Pacing or intellectual challenge. Optimal pacing challenges people just beyond their present level of ability. If challenged too

far beyond, people give up. If challenged too little, they become bored and learn little.
- Active involvement in learning, as opposed to passively listening to lectures.
- Regular feedback mechanism for students to tell faculty what works best for them, what they want and need to learn – and a faculty who hear and make changes based on student input.

The above factors point to the use of andragogy rather than pedagogical approaches to teaching adult learners. Moore (1997) argues that learners are always engaged in internal or silent interaction or virtual dialogue with either an author or presenter. According to Moore, a dialogue is purposeful, constructive and valued by each party. Each party in a dialogue is a respectful and active listener; each is a contributor, and builds on the contributions of the other party or parties. It follows that there are two types of dialogue: the internal 'virtual' dialogue and external 'expressive' dialogue. The two dialogues ought to converse with each other for learning for happen as Sharples et. al., (2007) explain, in order to constitute a 'conversation'; the learner must be able to formulate a description of himself and his actions, explore and extend that description and carry forward the understanding to future activity. They add that, in order to learn, a person or system must be able to converse with itself and others about what it knows. It can be inferred that unless the internal dialogue is artefacted it is difficult for others to engage with it and to track growth in internal conversation over time. Writing is a form of communication that encourages reflection and precision of expression, and when writing is integrated with the rich dynamic of fast-paced, spontaneous verbal communication in a face-to-face learning environment, the educational possibilities increase (Garrison & Kanuka, 2004). Students were required to write a blog daily on their cognitive process. The challenge

was how to create a mobile learning environment that exploited the devices that students had access to, provide stimuli for interaction while keeping a trail of the learning process.

MOBILE LEARNING ENVIRONMENT

In Africa, mobile phones are not a status symbol. Mobile phones bridge the digital divide between the technology-haves and the have-nots. Traxler (2009) observes that less privileged individuals are able to access information of their choice using their own devices without needing to accept constraints and conditions historically imposed on them. I infer from Traxler that mobile technologies have an emancipatory effect on less privileged communities and if well exploited could have a transformative effect on learning. To the extent that blended learning could be viewed as empowering learners by widening access to education, the integration of blended and mobile learning has potential of both widening access and enhancing the learning experience. According to Van 'T Hooft (2009), mobility expands learning across space and time and opens many opportunities for learning that is neither sequential nor consistent. This suggests that the blending of sequential with non-sequential, formal with informal, in space with across space, fixed-time with anytime creates new learning opportunities and impacts pedagogical designs. These new learning opportunities must take into account the challenges of having international students attending blended programmes. Biggs (1999) identified three challenges involved in teaching international students:

- **Social-cultural adjustment:** this is the stress that is associated with adjusting to a new culture. Although this is not the responsibility of a teacher, there is an obligation on the university to put in place necessary support.

- **Language:** it is difficult to learn if one is not fluent in the language medium of instruction.
- **Learning/teaching problems due to 'culture':** the cultural background of many international students make it difficult to adapt to the style of tertiary teaching adopted in the host country.

It can be inferred from Biggs that these challenges might affect students' socialization with peers and engagement online. To this end, a mobile learning environment was conceptualized to exploit the affordances of mobile phones owned and used by learners regardless of country with which they move across different contexts. Guided by Henschke's (2010) principles for stimulating learning, anonymity was used to create a mobile learning environment that blends short message services with the learning management system.

- An environment in which learners felt safe to express themselves, to ask and respond to peers' questions without feeling oppressed, domesticated or silenced.
- An environment that encouraged intellectual freedom to 'think-aloud', 'try-out' new things and reflect on lessons learnt.
- An environment in which the psychological distance between knowledgeable others (peers and experts) is reduced.
- An environment in which learners are equal partners in knowledge production

These characteristics augment curricula, andragogical approaches, and Henschke's seven principles that stimulate adult learning. Mobile learning has potential for interconnecting learning spaces; work, home, face-to-face, personal workspaces and learning management systems. It was therefore imperative that connectivity be used for interaction while supporting mobility of learners.

BLENDING CONNECTIVITY, INTERACTIVITY AND MOBILITY

Internal dialogue is both a cognitive activity and an outcome of reflection. Through internal dialogue, knowledge is constructed and deconstructed. The inputs to internal dialogue are not limited to external stimuli such as reading, listening and observing but also interaction with others. Internal dialogue is therefore more than knowledge acquisition or knowledge creation. In blending mobile phones with LMS, a learning environment that exploits connectivity and interactivity is created. In such an environment, members both support and sustain, elicit from, expand on each other's learning inputs, contributions, and products (Davidson & Goldberg, 2009). Hakkarainen (2009) identified three generations of technology-enhanced learning, the knowledge-acquisition generation, the participation generation and the knowledge-creation generation. According to Hakkarainen, the first generation is based on cognitive (knowledge acquisition) perspective; the second on social-cultural (participation) and the newer generation (the third) is aimed at overcoming the dichotomy between the cognitive and social-cultural perspectives. The portability and versatility of mobile devices, if exploited, has the potential to cause a pedagogical shift from didactic teacher-centered (knowledge acquisition – first generation) to participatory student-centered learning (encompassing both second and third generation) (Looi et. al., 2010) in an embedded learning context. Embedded learning argues that the closer a person is to needing to know something so that they can perform a task, the higher the motivation to learn. Technology and new delivery options provide access to information in the context of an individual's role, task and time available (DeViney & Lewis, 2006). It then follows that, the newer generation of technology-enhanced learning will exploit learner connectivity, interactivity and mobility to create seamless and safe embedded learning spaces across diverse contexts (Biggs, 1999;

Davidson & Goldberg, 2009; DeViney & Lewis, 2006; Hakkarainen, 2009; Henschke, 2010; Looi, 2010; Sharples et. al., 2007; Traxler, 2009). The challenge with creating seamless learning spaces is that private and public spaces become blurred.

SEAMLESS INTEGRATION OF PRIVATE & PUBLIC SPACES

The seamless integration of individual learning that happens in private learning spaces (mobile learning), collaborative learning that happens in public learning spaces (learning management systems) and cognitive artefacts created across time in both physical and virtual spaces (Looi et. al., 2010) are an effective implementation model. The environment becomes seamless when the contributions from both private and public learning spaces are anonymised. In private learning spaces, conversation is with self (internal), mediated either podcasts or learning resources and expressed through interaction with a mobile phone. In public learning spaces, conversation takes the form of interacting with peers and educator expressed verbally and artefacted through blog entries and/or podcast. However, rather than create environments where students feel invaded in their private spaces, the mobile phone could be used as an option extension of the LMS. However, the term option presupposes freedom of choice, but for most of our students the choice was limited because they had more access to mobile phones than Internet.

INTERFACING MOBILITY WITH LMS

One of the criticisms of LMS is that it is generally used to prescribe the pace and sequence by which materials are accessed. The web environment or LMS encourages teachers to place the content into a weekly reading list or modules, moving in a linear pattern through a semester (Herrington

et. al., 2005). The resources were structured in sessions e.g. Session #1: Introduction; Section #2: Disruptive Technologies, etc. The effect of this structure was that the products (i.e. artefacts) from each session, in particular podcasts, were associated with particular sessions. A day had an average of three sessions sandwiched with group work or discussion groups. The report back sessions from group work and discussions generated podcasts. Learners reflected on each day and podcasts served as a useful tool for scaffolding the making of a blog entry. There were three ways that learners used podcasts; (i) downloaded to a portable device for subsequent playback at a time and place of learner's convenience; (ii) downloaded to a flash drive for playback on a standalone machine; (iii) used a headset to listen directly at a point of access to the LMS.

In the next section, a blended approach for using SMS to support student learning is discussed followed by examples of how the model has been used.

IMPLEMENTATION MODEL OF BLENDED MOBILE LEARNING WITH LMS

The blended implementation model of mobile learning with LMS is located at the convergence of public and private space; mobile phone and LMS; and andragogy and pedagogy. A model for blending mobile learning with a learning management system for postgraduate non-traditional learners incorporates andragogical principles for creating a safe discursive environment with the pedagogy. The augmentation of mobility, connectivity and privacy of a mobile phone with anonymity creates a safe discursive environment in which interactivity is increased and internal dialogue artefacted. The LMS was a key pedagogical tool as it served both as a channel for disseminating learning resources and as a space for interaction with resources and knowledgeable peers. The meaning making process involved internal dialogue whose outcome was captured in a blog tool provided in the LMS. The resources placed in the LMS and the subsequent lectures were generated as podcasts which saw the LMS acting as a podcast server. Learners either subscribed to the podcasts via an RSS feed or downloaded podcasts directly from the LMS onto their mobile devices. While the LMS is an institutional tool, hence a public space, mobile devices are owned by students and therefore located in the private space. The mobile phones provide an anywhere anytime connectedness. Some students may also use mobile phones to connect to a public space (i.e. LMS) to interact with peers, educators and content. Figure 1 depicts the implementation model.

The learning resources are uploaded onto a LMS that serves as both a public as well as a private learning space. When a course site is created in the LMS, students registered for the course are automatically imported from the university's student administration system and become participants of the course site. An email account is automatically created for all registered students and it is this email that is used as default email for the LMS. All correspondence from the LMS to students is sent to the institutional student email address. When resources are posted on the LMS, an email notification is generated and sent to students' institutional email addresses. Most adult students have a minimum of two email addresses already; a work email and a private email addresses. This means that students already separate business from private work. Thus, the institutional email that is associated with the LMS becomes a third or fourth email address. As a consequence of this, students do not often access the LMS prior to attending the first contact session because they would not have seen or be aware of an institutional email address. It follows that the pre-session interaction with resources and peers through the LMS is limited before the first contact session. This challenge can be resolved through texting/SMSing to students through the LMS. In

Figure 1. Blended approach for using SMS for learning
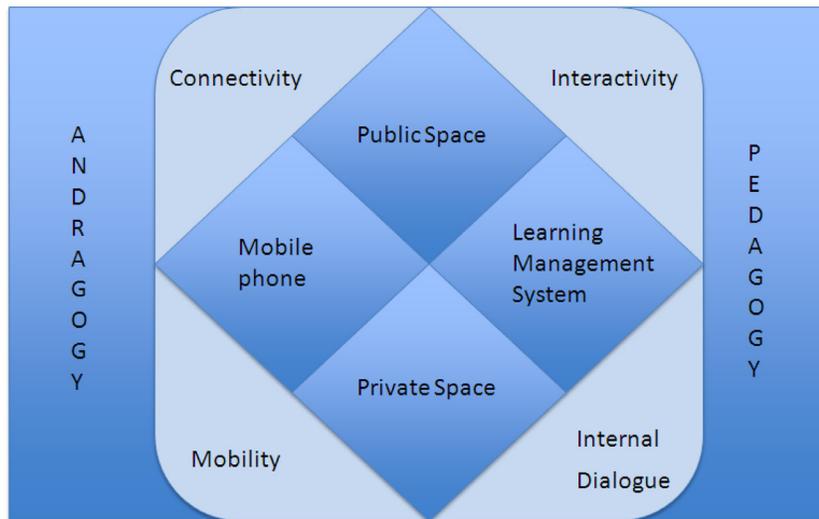
this case, the mobile phone, which is a student's private space, is used to invite students to interact in a public space. The mobility of students, and the extent to which mobile phones accompanied students all the time, meant that messages sent to the mobile phone were more likely to be seen than an email (unless the emails are received on a mobile phone, a service only available on expensive phones). When students finally access the LMS, learning tasks are designed such that students are expected to reflect (internal dialogue). Although students are expected to be self-directed learners, learning tasks are designed with specific learning outcomes (pedagogy). The LMS tools such as blogs are used to artefact students' internal dialogues. Students engaged with two types of blogs: public blogs (visible to the whole class) and private blog (visible only to the site owner – the course convener). The class comments on public blogs while private blogs provide a safe space for students to comment on their learning and anything course related.

Interactivity is conceptualized to include student engagement with reading resources in the LMS, attending lecture presentations, engagement in class discussions, group tasks and student

seminars. These activities generate podcasts that are uploaded onto the LMS. Like all resources, the LMS has an option to trigger an email notification to participants about the newly uploaded resource. Due to the varying degrees of access to the Internet when away from the institutional campus, students download the podcasts to mobile devices and/or mobile phones. These class podcasts are examples of resources generated and available in the closed public space and used in a private space. Some podcasts are downloaded from the Internet (public space), remixed and uploaded in the LMS or downloaded to mobile devices. Students then choose a convenient time and space to listen to the podcast. Listening to podcasts triggers internal dialogue or reflection, which is further blogged on. In order for reflections to be effective, listening to podcasts is often done when students are in isolation and in quiet environments. During this time, questions that arise from listening to podcasts are texted/SMSed to the Q&A tool in the LMS. The value of this is that students who might be in the LMS at the time, could respond to the question in the LMS and the Q&A tool sends the response to the author of the question. In this way, the mobile phone is

blended in the LMS. To the extent that the Q&A tool does not publish name nor the mobile number of the origin of the contribution, the interaction is anonymised and safe for both the author and the respondent. While interaction with a Q&A tool is one way of artefacting internal dialogue, another is through collaborative memos. These memos, short study notes, are generated either when a student is listening to podcast or engaging with other resources in the LMS. Students use mobile phones to send notes to a shared number for subsequent searching and retrieval via SMS.

The "always" connectedness of the mobile phones sandwiched between student mobility and interactivity is an indispensible environment for encouraging reflective learning through internal dialogue. When augmented with LMS, and careful rethinking of pedagogy, the affordances of this blended mobile learning environment could be enormous. The fact that students own mobile phones, use of the device in this manner by educators requires consent from the student. To this end, rather than sending messages to students' handsets, the virtual noticeboard provides a way of placing important notices on this board for students to retrieve using their mobile phones on demand. The advantage of the virtual noticeboard is that students with access to the LMS do not need to use a mobile phone to read the announcement especially when the virtual noticeboard is integrated with the LMS.

In the next section, examples of SMS uses to support student learning are discussed.

SHORT MESSAGE SERVICES (SMS) IN LMS

The SMS tool of the LMS allows students to send text messages to a mobile phone from the LMS. The sender has an option to restrict the message to users with particular roles e.g. site owners, participants or support. Alternatively a sender may paste a list of mobile numbers into the tool. The messages can also be scheduled to go out at a later date and time. Mobile phones are personal devices owned by learners and it is therefore important to give learners a choice to unsubscribe should they no longer wish to receive messages on their handsets. The LMS provided an option for users to unsubscribe. Another important consideration is that the mobile numbers are not matched to the user's name. The purpose of the SMS tool is to push messages from the LMS to students' handset. Messages sent from the SMS tool cannot be responded to.

Unlike the SMS tool, the Question & Answer tool (Q&A tool) is a bidirectional tool (sends out messages and receives messages). The Q&A tool allows users to send questions to the course site anonymously (the message is published and not the author's name or the mobile phone number). The purpose of anonymity is to ensure a safe environment for learners to express themselves without feeling suppressed or silenced. The context of work and education were so intertwined for most learners that learning had to make sense in the context of their work. The following posting in the Q&A tool illustrates this:

I don't want to sound ignorant, but I am when it comes to cell phones (don't like them, sorry Dr Dick ;-)). How does one get a gmail account - the gmail website is not very informative. Should we choose the webmail option?

The question shows the learner was not afraid to expose his/her ignorance or to think-aloud. The statement suggests that the learner was engaged in internal dialogue with self. Typical of adult learners, they would not want to publicly sound 'stupid' and ridicule themselves. The question was posted after a presentation on mobile learning and which demonstrated various possibilities of mobile technologies in education. The first response came from another learner who was an educator by profession:

An interesting thought:-) I agree that cellphones are not likable by everyone. The irony is that students like them a lot and also find them as indispensible. For interests sake, how did you start disliking cellphones? what happened?

In providing this response, the respondent seems to have been careful to ensure that the views of the author of the question were respected. It was comforting to know that not everyone liked cellphones but found it ironic that someone should dislike a device that is likable by many. However, the response ended with a question, which suggested that external dialogue was being encouraged. The author responded:

Thanks for the reply…I don't like cellphones because of the interference factor and because it's very time consuming in my line of work. I deal with about 100 companies and that many students in one year. Getting up to 9 missed calls in one hour from one student (especially over weekends) or countless SMS's is not fun. Fortunately more and more students have gmail, so I can use my e-mail and ten fingers to respond to their messages ;-)

The advantages of cellphones is the always connectedness regardless of the changing context of users. This connectedness provides a user with freedom to choose when to use the device. In making a voice call, for example, the caller and the one being called (the callee) should both have their mobile phones switched on. This means there is a convergence of time though space and distance of both the caller and the callee is theoretically immaterial. The absence of a way of knowing whether the 'callee' is available to receive a call such as is the case with social presence indicators in Instant Messaging software; there is no guarantee that the calls will always be successful. However, to the extent that SMS is asynchronous, the receiver does not need to have the device switched to receive a message as messages that find a mobile device off is held in a queue at the Short Message Control

Centre (SMCC). The SMCC is responsible for delivery of the message as soon as the device is switched on. SMS is more likely to reach the intended target audience (students) than email. Needless to say, an increasing number of young people rarely read emails and should an email be sent to them, the sender is expected to send a follow-up SMS alerting them to check their email boxes. As the response below suggests, cellphones are ubiquitous and convenient devices:

Cell phones are interesting devices but I could understand your lack of interest. Even with your line of business I think they are great companions and for educators they are helpful in promoting and management of students learning and evaluation. Because they are handy learners of today prefer them as it could provide on the go information and opportunities for sharing even in 'difficulty places'. I think the trend in our technology driven society is very compelling and we could only need to re-adjust to the changing times.

While taking cognizance of expressed misgivings, the above statement focuses on the positive uses of cellphones and observes that rather than fighting the technology, it must be embraced because we are living in a technology driven society. It is becoming a common practice for people to either have two or more cellphones or sim cards, one for private use and the other for business.

I actually have 2 cellphones ;-)! One work, one private. Can't do without it when I need to contact students to organise interviews and to remind them of important classes. And I use it for photo's and video's. So yes, they can be useful...

It can be inferred that learners seek to be autonomous and to be in control of both the information they receive and the devices they use.

The anonymous Q&A can also be used for obtaining feedback from learners. The integration of anonymity with the privacy of a mobile

device allows users to feel safe and confident to be expressive on both content and administrative issues of the course. Teaching adult learners is like teaching colleagues and it is sometimes difficult to give honest feedback especially if such feedback in negative. The use of anonymous SMS empowers learners to give honest feedback. It is no longer necessary to wait until the end of the programme to get feedback from learners and because feedback is timely it can be used to benefit the current cohort of learners. This is particularly important in block release modules because the contact time with learners is short and there is no time to defer decisions. Learners spend most of the time studying in isolation during the pre and post contact week so the time spent together with learners needs to be optimized. Mobile phones are used to capture the views of the learners about course content and can also be used to reinforce important points of the learning activity.

VIRTUAL NOTICEBOARD

Mobile phones have changed the notions of being online and offline. When learners are offline, they are still connected on mobile phones and therefore rarely go offline. The seamless integration of the mobile phones with the web, is an effective way of blending 'being online' and being 'connected'. Unless the site is cached, LMS, is inaccessible when offline. In contexts where Internet access is intermittent and electricity is unstable, dependence on the LMS for delivery of notices to students does not work. The use of a virtual noticeboard provides a ways of ensuring that messages such as important announcement are placed in both the LMS and on a virtual noticeboard. Messages posted on the virtual noticeboard can be retrieved using a mobile phone regardless of whether a user in online or offline. For example, to retieve a message from a course site, a user sends the message: *Edn6099-news*. The Q&A, a tool within an LMS, allows users to SMS questions and online

users are able to read the postings through LMS. When offline, users with WAP enabled mobile phones and Smartphones, are able to access the LMS on the mobile handset. However, the majority of users do not have Smartphones, and the integration with the web could be through text messaging. A virtual noticeboard is not a tool in Vula but is implemented in a tool called the Dynamic Frequently Asked Questions (DFAQ), developed by the author and allows authorized users to post messages to the noticeboard using SMS and other users retrieve latest messages by sending an SMS to the noticeboard. Another example of this integration is the microblogging. In microblogging, users can send an image or video clip to a blog. The user, if desired can later edit the mobile blog entries.

COLLABORATIVE MOBILE MEMOS

Collaborative mobile memos is a shared repository where learners post brief study notes for subsequent retrieval when needed. As students study, the study notes are continuously sent to the repository. The memos in the collaborative mobile repository can be searched and retrieved by sending a keyword a short code. Example: *Edn6099-memo heart…an important body organ*. By posting memos a knowledge resources is created which is searchable. Example: *Edn6099-memo heart? OR Edn6099-memo important body?*

A related use of collaborative mobile memos is building a resource of acronyms. In technical fields such as computer science or information systems, students are overwhelmed by the number of acroynms that they need to know. Collaborative mobile memos provide a shared space for learners to deposit meanings to various acroynms and be able to retrieve them via SMS. It follows that not understanding an acronym could stand in the way of a student mastering the learning material and this problem is compounded when learners study in isolation as is the case in block release

programmes. In order to address these problems, learners write down descriptions of acronyms as they study. Thus, collaborative mobile memos exploit connectivity to both post and retrieve, interactivity by way of searching the repository and mobility which allows use on demand regardless of changing context. The mobile memos feature supports dynamic creation and spontaneous acronym look-ups. Learners use their mobile phones to create shared glossaries that are searchable using keywords in the description.

COLLABORATIVE-NETWORKED LEARNING

Mobile phones enable socially networked collaborative learning. This type of learning involves creating a task that encourages cooperation, interactivity and social engagement. The task, which requires use of mobile phones, is pedagogically grounded in teaching critical reading skills, interrogation of a reading or collaborative thinking. For example, in the EDN6099 course, a task or reading is assigned a number e.g. 111. The users are required to contribute either in the form of a response to a question or a comment on a presented idea. Working independently, each learner is asked to use their mobile phones and text their contribution. In practice, the educator will create a topic by texting a short code e.g. prefix a message with a course code, edn6099 followed by a text. *Edn6099 Welcome 2 mobile learning.* The tool assigns the task a number, for example, 111. Learners are given the number 111 and asked to post their comments to that specified code. Learners might post: *Edn6099-111 + we r explorn & pushn boundries*

Edn6099-111 + g8 but y don't we c this? The '+' tells that tool to append the message to task 111. This tool extends the limitations of the 160 characters of the SMS as it allows a user to add to the message. It is an effective way of gathering student opinions on an issue or contribution

or feedback etc. In one of the uses of the tool in a postgraduate class, a task was created which required students to decide how they wanted the class to spend a Friday afternoon and to motive why. In a space of 10 minutes, student views were gathered beamed to the class for all to see. All contributions were anonymised though students could see their individual views. A decision was immediately reached and the contributions served as a record of the process. In a health sciences first year class, the class was asked whether it was morally right for doctors to charge patients for their services. In order to ensure that every student's voice was heard, a task was created, assigned a number and invited contributions from the students. Other uses included use of the tool to get feedback from students on their learning.

PODCAST-MEDIATED REFLECTION

Learning is a reflective process and without reflection, learning cannot take place. However, reflecting on an article is a process of interrogation of text through questions. In essence, the reader 'interacts' with a distant author and attempts to make meaning. The context of a reader is influenced by the task at hand and the social structures on a readers mind. It means that reflection does not happen in a vacuum, the reader brings what they know, to understand what they need to know. Both when reading an article and listening to a presentation, a learner is in a continuous state of linking between the known with the need to know. An event such as listening to a lecture is a useful trigger for reflection. However, there is no time for reflection during a lecture. Learners take notes to help them reflect on a lecture later. Thus facilitating reflection through podcasts has potential for enhancing the learning experience.

Guest lecture podcasts were designed for reuse and involved a single session. Student seminars were recorded as single sessions with multiple presentations. Although the student seminars

had an informal feel so as to help students relax, discussions were serious and podcasted.

A lecture is recorded and the audio files are converted to common formats such as mp3 and uploaded on to the LMS. Using tools like iTunes, learners subscribe to the LMS podcast feed, sync the iPod or mp3 player and they have the podcast on a handheld device. Once on a handheld device, learners are able to re-live a lecture at their convenience and reflect. During such reflection, learners are isolated from both peers and teaching staff. Should a need arise where they need to ask questions, the mobile phone is used to SMS the Q&A tool. In addition, learners use blogs to keep an online reflection journal.

During the contact week, several podcasts were generated from guest lecturers, student seminars, group discussions and group task report back sessions. Although there were other artefacts, such as notes, mindmaps and power points, podcasts were the only media that captured narrative details. The LMS served as a podcast server on which the audio files were uploaded to generate podcasts. With the use of different aggregators, learners subscribed to the course RSS feed and received podcasts as soon as they were published. Through listening to podcasts students were able to re-live the face-to-face engagement, reflect on issues of the day, and post their reflections in a blog. To this end, podcasts served this mediation role to support reflection. Another value for podcasts arose during the post-contact week when learners work independently on a scholarly essay, which was a deliverable for the course.

DISCUSSION

Although adult learners enrolling on the postgraduate programme can direct his or her own learning, has life-round experiences with learning needs closely related to their changing social roles and are intrinsically motivated to learn, they need more structure to ensure that effective learning

happens. The extent to which the programme is offered in block format, which is deliberately planned to take place during vacations make access to higher education possible to non-traditional students. The block release format is planned such that pre-contact week interaction is mediated via the LMS but access to the LMS at this point is uneven. Accessing the LMS from some parts of Africa is difficult. Learners may experience either power failures or unreliable Internet service providers that may take hours and sometimes days to restore. LMS tend to be teacher-centric while mobile learning is learner-centric. Thus the blending of LMS with mobile learning is the blending of teacher-centric and learner-centric perspectives. In both environments, internal dialogue maybe triggered differently.

As students get more distributed in different parts of Africa, the challenges of access to the Internet and hence the LMS increases. This is further compounded by the lack of a single mobile network in Africa and therefore there are no standardized connectivity rates for the continent. The Internet access in many parts of Africa is expensive and most students cannot afford it. Even when students are in the same country (for example two of the students are based in Nigeria), interactivity between them is a challenge.

The contact week becomes an opportunity for socialization, engagement with learning resources, creation of 'take-away' resources such as podcasts, downloading of resources for offline reading, artefacting internal dialogues (blogging) and building of trust between one another. Once trust is built, the public and private spaces begin to collapse and students become 'friends'. Despite the convergence of these spaces, students respect their privacy. This is manifested through their decisions on when to use a private or public space. The use of mobile phone as a learning tool is enhanced through trust. It is this trust that is drawn upon during anonymous interaction. For example, students were selective as to whom they shared their private phone numbers, and their Skype id.

This suggests that student private spaces may be unavailable for teaching and learning unless by mutual consent.

The internal dialogue is a cognitive process that happens in a private space (cognitive mental space). In the absence of a 'window' into the cognitive space, it is difficult to gauge what is being learnt and how it is being learnt. While embracing the principles of andragogy, the incorporation of a learning requirement for daily blogging in a private space (an area visible only to the educator/site owner) of the LMS provides access to the internal dialogue in safe environment. The use of microblogging, where mobile phones are used to write to a blog in the LMS ensures that artefacting of internal dialogue is also mediated by the mobile phone. To the extent that microblogging provides a way of transforming a cognitive activity into an artefact accessible by many in the LMS, microblogging is an example where a mobility-connectivity-interactivity-internal dialogue cycle is completed. Microblogs presupposes that a user will revisit the blog post and potentially edit it to make it more meaningful. This means that for students who do not have access to the Internet this refinement of the microblog post may not happen in time.

For example, the use of a forum to post self-introductions, allowed learners to carefully consider the type of information that they were prepared to share with the 'unknown' audience and what that audience would think about them. Learners were therefore isolated both physically and epistemologically despite access to the LMS. The educator pre-selected the readings and posted them in the LMS. Learners were expected to engage with the resources. It follows that access to the LMS alone was an insufficient precondition for internal dialogue. An internal dialogue is an outcome of active listening or reading. The contact-week was a socialization phase, learners engaged with the LMS, with peers and teaching staff. The lecture presentations and group discussions generated podcasts that were downloaded to handheld devices for listening offline. Through listening to podcasts internal dialogue is triggered, and resulting questions are reflective, and when a mobile phone is used to SMS a question, internal dialogue is artefacted. Until internal dialogue is artefacted it is difficult to know whether it has occurred, and what form it takes. The post-contact phase involves researching and writing a scholarly article. During this phase learners continue socializing using instant messaging (IM), looking up the virtual noticeboard for course news, and re-live some lectures by listening to podcasts. Internal dialogue is not time and space dependent and can also happen with a trigger.

CONCLUSION

The chapter has discussed how anonymous SMS were seamlessly integrated with an institutional learning management system to create a blended mobile environment based on andragogical principles. Using a postgraduate programme at a contact higher educational institution that is grappling with an increasing demand of access to higher education by non-traditional students, the limitations of current structures and the affordances of emerging technologies to alleviate the challenges has been explored. Due to the always-connectedness of mobile phones, and the availability of the resources through the LMS, learners engage with the resources with an awareness that contact with knowledgeable others is possible via a mobile phone should a need arise. The LMS serves as an intermediary communication proxy for the class. The LMS is a public learning space, a socialization space, and a communication space. The mobile phone is a private learning space, a socialization space and a communication space. The value of blending mobile learning with LMS is that these spaces converge thereby optimising connectivity, interactivity, mobility and internal dialogue. To this end, the following is recommended:

Interactivity: via Learning Management System

LMS is an institutional public space with potential for use as a learning space, social space and a communication space. As a learning space, the use of the LMS should not be limited to it being used as a resource distribution channel. The resources placed on the LMS must be accompanied by tasks that trigger internal dialogue. As a consequence of the rich work experience that adult learners bring to the class, tasks should be designed to require students to draw from their experiences and these tend to trigger internal dialogue. As tools for interaction, it bridges the public with private tools (such as mobile phones) to maximize interaction.

Connectivity: Mobile Phone Interface to LMS

Access to the LMS presupposes access to the Internet. Do not assume that students access and read emails. Mobile phone connectivity is more guaranteed in many parts of the continent than Internet connectivity. On the first instance, obtain students mobile phone numbers and seek permission to use the students private device for educational purposes (this is usually not denied). Let students know the class short code number (a mobile phone number that links to the LMS). This number is required for Q&A, virtual noticeboard, collaborative memos etc. Assign students a small test task to ensure that the class is on the same page.

Mobility: Mobile Phone for Artifacting Internal Dialogue

Assume that students are mobile and always have their mobile phones with them. Create ways that students can post thoughts/ ideas anytime anywhere. Ensure that a safe think-aloud environment is created where students are stimulated to post ideas, questions, give and receive feedback. Adult learners welcome opportunities to comment on peers' work and this must be encouraged. Ensure that an artifact of such engagement becomes a resource for the class.

Internal Dialogue: Access to a Cognitive Process

Encourage discursive engagement that facilitates artifacting of cognitive processes. Despite the always connectedness of the mobile phone, interactivity mediated by the LMS and availability of tools such as the Q&A, virtual noticeboards etc there is no guarantee that students will blog about their cognitive processes daily. Ensure that maintaining a daily online journal is part of the course. This brings the activity to the centre rather than as a peripheral optional activity.

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ADDITIONAL READING

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KEY TERMS AND DEFINITIONS

Artefact: A persistent evidence of students' work which include an online journal, or a podcast or anything that can serve as evidence of work.

Artefacting: A verb used to describe the process of creating an artefact.

Non-Traditional Student: An adult learner not straight from undergraduate who juggles work, family and education at the same time.

Short Message Service (SMS): Also known as texting all mobile phones have this feature and is the most widely used mobile facility in the world including students.