



Increasing Interaction by Integrating Short Messaging Services (Smss) into the Virtual Open and Distant Learning (VODL) Teacher Education Programme: A Case of Bindura University in Zimbabwe

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ABSTRACT

Distance teaching and learning in most developing countries have met with high dropout (Kamau, 2001), because of lack of support, limited interaction & engagement and collaborations amongst distance learners. Most distance learners are scattered in very remote and poor areas and accessing high tech learning intervention is a challenge to the majority. These researchers explored the use of Short Messaging System (SMS), for Bindura University of Science (BUSE)'s Virtual Open and Distance Learning (VODL), student teachers' programme. Interview guides and questionnaires were used to collect data. SMS is 'anytime and anywhere', convenient, affordable and accessible. SMS is cheaper and accessible to almost all distance student teachers. It offers more affordances because the students own mobile phones and have the SMS facility. Distance student teachers raised concerns on the storage of spaces in messages received and sent. The distance student teachers applauded the SMS intervention.

Keywords:

Short Messaging System (SMS),
Distance learners, Constructivist
theory, Interaction-engagement, Virtual
Open and Distance learning

INTRODUCTION

Literature suggests the usefulness of emerging technology for distant teaching and learning (Ng'ambi et al, 2011). On the other hand, distance education programmes that are run in some countries especially developing countries like Zimbabwe have serious challenges such as lack of internet connectivity and poor facilities and equipment, and poor supply of electricity etc. In this concept paper, the researchers explored the use of SMS to increase interaction among students or between students and lecturers in the distant learning context.

Some of the challenges that such programmes face are lack of interactions and engagements amongst students and between students and their lecturers. Emergent Technologies, such as -podcasts, online forums, chatting, social forums could assist and benefit distant learners as articulated in the literature review. However, poor supply of electricity and limited internet connectivity, cripple the efforts of the distance learners to access learning. Seemingly, these are balanced with wide spread mobile phone networks, the potential for solar power mobile phones, leaving the only emergent technology, which could be maximized in their scenario: the SMSs (Kabweza, 2013). Against this backdrop, this concept paper is an attempt to suggest ways in which lecturers and learners in distant education programmes can benefit from increased interaction by the use of SMSs.

From 2000 to 2011, Zimbabwe experienced brain drain that was catastrophic, mostly in the secondary school science areas. The majority of science teachers moved to the neighboring countries to look for greener pastures, due to the melt down of the economy. The most affected were rural schools which were already under staffed. Against this background, in 2010, Bindura University of Science introduced a distance education teachers' training programme called Virtual and Open Distance Learning to train teachers who could cushion the under staffed schools. Various centres were established in the rural areas at some boarding schools in Mashonaland Central and Matabeleland provinces to facilitate four weeks block of face-to-face sessions. The VODL programme emerged as an institutionally born strategy to satisfy the training needs of the prospective students who are already employed or wish to be employed by the Ministry of Education, Sport, Arts and Culture. These students are either untrained or need to upgrade themselves. Temporary teachers and diploma holders are enrolled as students by BUSE for Diploma and Degree programmes respectively at different VODL centers. The student teachers take their courses during the school vacation periods and during the school term continue working independently at their various work places. These students do not have access to learning resources and consultation with the lecturers or peers. Due to financial challenges, fees payment is on

monthly basis minimising the challenges of one off payment system.

In pursuance of achieving the Millennium Development Goal Number 2, which is Universal Education for all, the VODL programme facilitate in the training of science teachers, who in turn, will also facilitate in the teaching and learning processes for the children. The current conventional science teacher education delivery system cannot totally cater for the country's demand for science lecturers (<http://www.buse.ac.zw>).

The VODL programme does not have the ICT facilities as it has campuses outside the main university campus; hence the student has no internet access but has mobile phone connectivity. The SMS technology is one of the most stable mobile technologies to address the communication need of the students (So, 2009).

According to (Kabweza, 2013), about 97% of the Zimbabwean populace uses cell phones which makes Zimbabwe the second highest mobile phone users in Africa after South Africa. Although the greater majority of schools in the rural areas including the centres do not have internet connectivity, fortunately, most places in these areas have mobile phone network. There is a high number of mobile phone ownership, acceptance and usage within the VODL student teachers.

Lominé and Buckingham, (2009) concluded that SMS allow users to interact and be engaged. It further supports, enriches and enhances students' learning experiences. The motivating factor of the SMS tool is that it will cover a greater distance, because Zimbabwean mobile networks have expanded and are accessible, covering most rural areas. It also allows just in time communication, as long as there is network connectivity between the mobile phone and the service provider. When students go to their respective teaching stations after the face to face (F2F) session, they have to reflect, simulate their course content, there arising the need to seek clarification from peers and course lecturers.

Against this background, the authors of this concept paper believe that SMS can be used significantly to improve interactions and engagement in teaching and learning in the training of student teachers. Fully utilising this only available and affordable emergent technology seems to be one of the best approaches for this scenario. The affordances analysis of SMS is that they are found in all mobile phones, most students own mobile phones and the students are using them to communicate. SMS has a facility on message delivery feedback and there are cost effective compared to other mobile devices.

OBJECTIVES OF THE RESEARCH

The objectives of this concept paper are;

- To suggest the possibility of the use of SMS in the training of distant student teachers
- To enhance pedagogical innovativeness, in the training of distant student teachers.

RESEARCH QUESTIONS

1. Does SMS really increase interactions amongst students and between students and lecturers in Distance Student Teachers' Training Programme?
2. What is the level of engagement amongst students motivated by the use of SMS in the teaching and learning in Open Distance Learning Teachers' Training Programme?

It is assumed that SMS benefits are going to be in the form of feedback to student teachers from their lecturers and student to student interaction after the face to face blocks. Students had the phones before but it was after this exploration that they appreciated the usefulness of SMS in their studies.

The affordances of the SMS tool are;

- a) Student teachers own mobile phones and they are familiar with the SMS functions.
- b) SMS will help distance education student teachers to interact or engage as student-student, student-tutor and tutor-student.
- c) SMS is cheaper compared to other mobile facilities.

THEORETICAL FRAMEWORK

The research was guided by the Salmon's 5-stage model from <http://www.atimod.com/e-moderating/5stage.shtml>. The model is used to reflect on constructivist epistemology that incorporates the notion of "social negotiation". Social negotiation recognises that learners learn by challenging their thoughts, beliefs, perceptions and existing knowledge through interacting with other learners and with the lecturers (Hedberg, 2003) cited by (Viljoen, 2005). Quality learning environments should therefore give learners opportunities to interact and engage with other learners and with their lecturers.

The constructivist theory of learning, states that learners construct an understanding of the world through the process of acquiring knowledge and reflecting on actual experiences. According to this theory, 'learning is an active and social process, not static accumulation of data and skills', (Vygotsky, 1978). This technology driven instructional design then aims at developing learning platforms that are deeply rooted in this learning theory in order to achieve a technologically and pedagogically rich platform.

The figure 1 below shows the Salmon's 5-stage model that guided the researchers in carrying out the research. The researchers added a stage 0, which is very crucial as it made an awareness that calls for those who are willing to pilot-run the research.

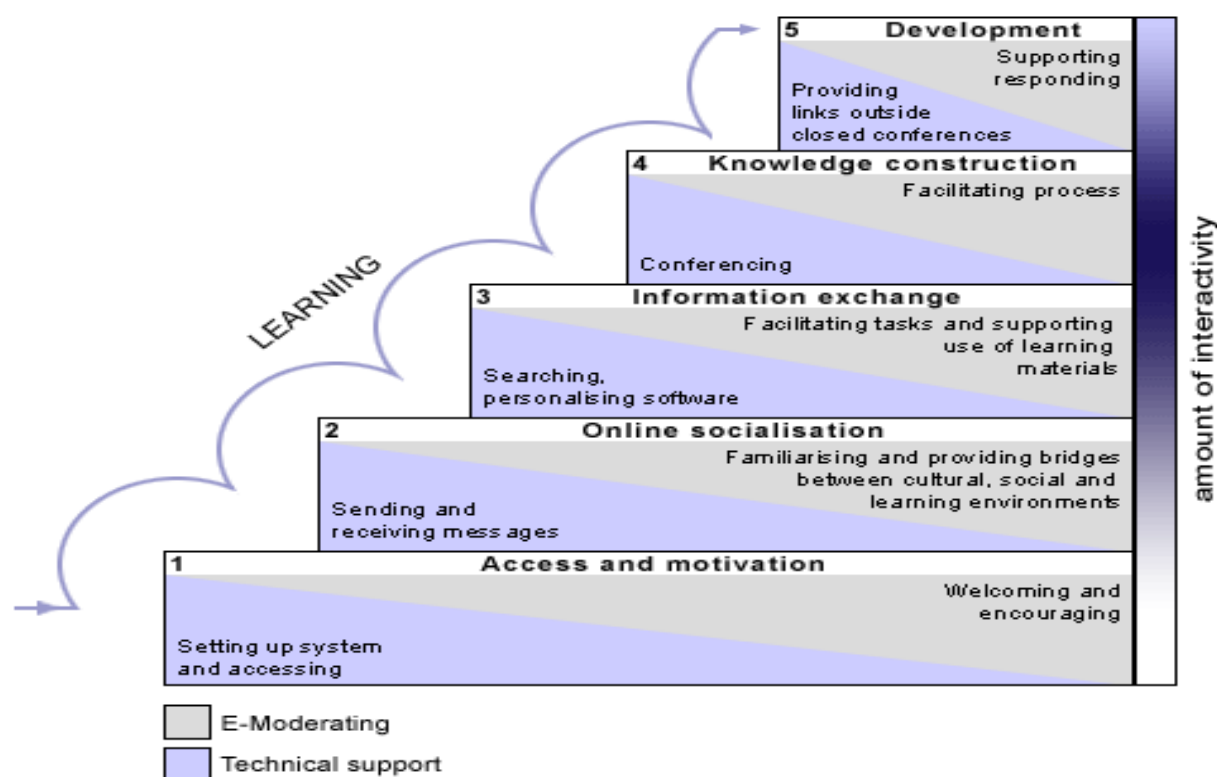


Figure 1: Salmon's 5-Stage Model (source <http://www.atimod.com/e-moderating/5stage.shtml>)

Stage Zero: Awareness to the group and those willing to participate in the trial to register their names with the researchers.

Five stage model stages	Activity on mobile phone (SMS facility)
1. Access and motivation	Setting up of sms groups and identifying learning goals of the project
2. Online socialisation	Group members testing sending to each other greeting messages "hallo". The participants are going to be assigned unique codes and demonstration on how to use them in the group discussions. Participants establishing their online identities and then finding others with whom to interact
3. Information exchange	After reading provided offline materials, students can start interactions as peer-to-peer, student-to-teacher. Participants share information relevant to the course with each other, a form of co-operation or collaboration occurs supporting for each other's goals
4. Knowledge Construction	Students construct their knowledge gained from the collaboration that took place, course-related group discussions that will occur and the interaction will become more collaborative. The communication depends on the establishment of common understandings.
5. Development	The students respond to knowledge constructed by applying learnt concepts to real life situation

Table 1: Five Stage Model that the researchers used for carrying out the research (source <http://www.atimod.com/e-moderating/5stage.shtml>)

This paper addressed issues of student teachers' interactions and engagement despite their geographical location. Currently, when the student teachers leave the centres going to their respective schools, interaction amongst the student-student, student- lecturer and lecturer - student is reduced or becomes non-existent

until the next F2F block session. The researchers dealt with the issue of interaction and student engagement in remote areas. The increased numbers of learners in different locations has increasingly made it difficult to provide one to one support and consultation with students. Library learning material is scarce and

inaccessible. The students who are close to BUSE can have access to resources and consult with the lecturers compared to those who are in very remote places.

REVIEWED LITERATURE

A number of researches are underway in higher education and some schools have already accepted the use of mobile phones in their classrooms. The modalities are still to be reached from these researches.

Ng'ambi et al (2011), mobile phones are increasingly becoming a requirement to keep up with the demands of everyday life. Advancements in these mobile devices are making them even more practical not only for on-the-go communication, but also for on-demand information sharing, training and learning (Luisito, 2008). A greater number of higher education institutions in both developed and developing countries are exploring the use of m-learning pedagogically in education. Mobile phones are affordable and an extreme interest among students to utilise them for results in facilitating learning. These several reasons call for use of mobile phones in teaching and learning in higher education in Zimbabwe.

SMS is already popular outside academia, therefore educators are mainly left to import and adapt to a tool that successfully exists and is evident, (Lominé and Buckingham, 2009). SMS can be used on all types of mobile phones; students are familiar with sending and receiving SMSs and thereby affording learning regardless of time, place, age or socio-economic background.

The University of Ulster in Northern Ireland has had great success in the use of text messaging, witnessed by the reduction of student drop-out. The students appreciated the "We missed you in class" texts and the students wanted the university to expand the service to other areas like assignment deadlines (Nix, Russell and Keegan, 2006) cited by (Luisito, 2008). Makerere University and University of Pretoria (UP) in South Africa have recorded successful attempts in using SMS to support distance learners. Post-graduate students in the open-education program had no email or could not access e-learning resources, but all had mobile phones, UP used mobile phones very successfully to administrate their paper-based distance education programs, achieving almost immediate communication by text messaging (Brown, 2005), cited by (Luisito, 2008).

Jan Herrington, Anthony Herrington, Jessica Mantel, Ian Olney and Brian Ferry (2009) have explored the use of mobile technology (m-technology), devices in teaching and learning in Higher Education and they gave various applications areas of the mobile devices as pedagogy tools. Despite the significant potential of m-technology, higher institutions are using teacher-centred teaching approaches, rather than a more constructivist approach that is learner-centred (Herrington et al 2009). The benefits of m-learning to the students will be gained through collaborative, contextual,

constructivist learning environments (Tangney, 2005) cited by (Herrington et al 2009).

'The challenge for the lecturers and technology developers of the future will be to find a way to ensure that this new learning is highly situated, personal, collaborative and long term; in other words, truly learner-centred learning.' (Naismith, Lonsdale, Vavoula & Sharples, 2004, p. 36) cited by Cobcroft, Towers, Smith and Bruns (2006)

Vygotsky cited by Cobcroft et al (2006) propounded that m-learning supports collaborative learning and social construction of knowledge is primarily significant.

Tina L, Mensor F, and Norziati M. (2011), says SMS use has a number of positives over other mobile technologies such that it enables just in time communications.

- Billions of SMS messages are being sent every day around the world.
- SMS messages, which can be written quickly, always carried everywhere, even in your pocket.
- The use of "predictive text", offers enormous learning opportunities (Prensky, 2005).
- SMS creates a platform for students to actively and independently engage with learning resources innovatively thereby managing their learning experiences.
- It enables affordable communications amongst peers, study groups, students-lecturer, and lecturer-students.
- It expands generic feedback and motivational messages on assignments, class work, discussions etc.
- SMS enhance student interactions, engagement in their learning.
- Lecturers listen to learners and understand that the mobile phone is now ubiquitous of communication which the young see as part of their life.
- SMS offers synchronous and asynchronous interactive communication in situations where previously there was no communication at all, as between people in jungle villages.

Furthermore, Tina et al, (2011) sees SMS as a tool of integrating ICTs in education and combating resistance to the use of technology. The other advantage is that SMS removes formality and engages students who are reluctant to learn. On the other hand, it promotes focus in students and raises self esteem. Because SMS features confirmation of message delivery, a user seldom gets a busy or engaged signal as other facilities do during the peak network usage times.

Short messages are proactively delivered to mobile phones that are typically kept in the user's pocket

and can be stored for later reference. SMS is a very inexpensive method of communication. 160 characters take up as much room as a one-second voice call. Messages are delivered immediately (or when the phone is turned on). SMS has been used in administrative and academic purposes, learner assessment, e-counseling services and learner development support (Tina et al, 2011). It is the same authors who identified five categories of SMS affordances and their contribution in teaching and learning. These are content which helps learner locate/remember important course facts easily, face-book that can remind and motivate students to participate in discussion forum, tips which can provide strategies on how to do well in their studies, motivation which helps to persevere in the learning process and course management which timely announcements related to tutorials/assessment.

These categories lack pedagogy applications and use traditional methods where the communication follows top-down approach. This does not meet the 21st learners' needs and the constructivist learning approaches. The above categories only provide synchronous communication. The researchers proposed the use of asynchronous learning, which is a student-centered approach that emphasizes the importance of peer-to-peer interactions; this approach combines self-study with asynchronous interactions to promote learning.

http://en.wikipedia.org/wiki/Asynchronous_learning

Despite the high returns, SMS is affording to distance education, it has some limitations that can be a challenge to novice implementers, these are as follows:

- The initial extra cost of setting up affected both the researchers and the student teacher participants
- Delaying in transferring and receiving messages due to poor network connectivity.
- Text messaging box will get so full with incoming and sent text messages and this stops other incoming messages.

Tina et al (2011) raised the issue on the feeling of isolation and alienation by distance learners due to lack of interaction and communication with fellow learners and tutors. The university administrators call for higher level of support to the learners on a regular basis.

METHODOLOGY

The research was carried out at Chindunduma High 1 School; which is one of the BUSE, VODL centres in Mashonaland Central province, Zimbabwe. The participants are distance student teachers; all affirmed that they have or owned mobile phones. The research purposively selected ten (10) student teachers who were doing Computer Skills (CS020) course for this Case Study.

Bower (2008) presented a design methodology that matches learning task with learning technologies. In

this concept paper, the design is used in conjunction with Salmon's 5-stage model.

The distances between the VODL student teachers' work places locations and BUSE, inhibit interaction amongst the students and between students to lecturers. During the four weeks face to face encounter, the students will have no time for simulation and reflection; this will start as soon as they get back to their work places. This raises the need to seek clarifications and explanations on course content or other educational issues.

The need to increase interaction after the face to face encounters is a matter of urgency that needs to be implemented before they are negative consequences on the programme.

The researchers used mixed methods, where quantitative and qualitative data was collected and analysed using SPSS. The research is an action-based, characterized by learner-led activities and the lecturer facilitating or taking an observational role. The researchers prepared a student questionnaire, which sought to gather the model of mobile phones they owned, how the student teachers used their mobile phone facilities and their opinion on students using SMSs in their learning.

During lectures, the researchers demonstrated the use of offline resources that have been downloaded and put on the computers. A tutorial on the SMS project was introduced and modalities explained to the participating group. The initial number of participants was small hence they could use the group facility on phones to create SMS-group accounts, where only contact mobile numbers of group members will be added, in this case the participants. The researchers and student teachers created group accounts on their individual mobile phones and sent "Hallo" messages to all group members, including the researchers.

After reading the offline resources the students started using the SMS-group contacts created above, that acted as a shared portal to interact and engage with each other on issues read, either asking questions, seeking clarifications or applying learned knowledge. This SMS engagement tasks were exchanged over two weeks with every student expected to contribute at least three times. As the students made their contributions, they were also able to read other contributions by others within the group and comment on them either by asking more questions or by coming up with similar or differing points of view. The duty of the researchers was to make motivational contribution on the student sms engagements, facilitating minimum contribution enabling students to generate their own knowledge collaboratively.

In order to increase interactions and engagement, the tasks required that the notes should have the following affordances that are deemed very crucial, read-ability, share-ability, accessibility, and understand-ability. Affordance of the SMS technology are varied just to mention a few,

DISCUSSION

The sample consisted of ten (10) student teachers who are studying Computer Skills CS020 course, which is a core course for the Diploma in Science Education. This group was purposely selected from the group of students enrolled for the CS020 course. Membership to the group was on voluntary basis.

Following the Salmon's 5-Stage Model, the researchers added another level prior to the first stage, which they called Stage 0, whereby she outlined the course topic that was ICTs integration in the teaching and learning. The emphasis of the topic was not really on the ICT tool, but on the pedagogic of using that tool. Here the researchers created a learning activity following the Salmon's 5-stage model.

The Researchers' Stage 0

The CS020 course outline has a section that focus on ICT integrating into the teaching and learning. Student teachers are expected to identify technology tools and how they can integrate them into their teaching and learning to promote critical-thinking, creativity, collaboration, interaction, engagements and community-mindedness. Technologies like podcasts, blackboard, social networks, SMSs, Web2.0, edublogs, etc. were discussed at this stage. The researchers explained how SMSs can be used in the teaching and learning and explained that only ten student teachers are required to register with the student representative in first come basis, in order to participate for the trial of using SMSs in the VODL programme.

Stage 1 Access and Motivation

The trial group met and the researchers welcomed the participants and explained the modalities of trial SMS project. A group representative was selected to coordinate task activities. A group pre-task interview was video recorded and participants introduced themselves by giving the following information;

- i. Giving their names
- ii. Age (optional),
- iii. Name of school they are teaching,
- iv. The distance of the school from BUSE,
- v. What type of mobile phone they own or use,
- vi. Mobile network connectivity at their school,
- vii. How often they used the SMS facility on their phones?

A pre-assessment questionnaire was distributed by the student representation and completed by participants.

The researchers demonstrated on how to create an SMS group contact list in their phones as a group shared portal. Member's contributions could be viewed by all group members and responses could be viewed by all members as well. The researchers demonstrated by sending a test SMS to all group members and eight of them received the SMS promptly. The other two

members, deliveries were still pending. The researchers explained that it could be due to network connectivity; their service provider had a weak signal in the area where the research was taking place and further explained that as soon as they got to a place where signal is stronger the message will be delivered.

Stage 2: Online Socialisation

After the participants created their group SMS accounts, the researchers distributed \$1 worth of SMS top up cards to each participant. These had 20 text messages. Each member was to send a 'Hello' message to all SMS-group members.

Stage 3: Information Exchange

The participants were divided into two groups of five members each, Group A and B. The researchers downloaded two papers that discussed the use of SMSs in distance teacher education and the second one on using SMSs in the classroom. The students were expected to read and start a discussion on issues raised from the articles. This enabled interaction to begin, with the hope of making a presentation on the discussions on an assigned date.

Stage 4: Knowledge Construction and Stage 5: Development

The stage 4 and 5 were not reached in practice but instead the researchers showed the group a video from YouTube where students were using SMSs in class to construct knowledge, *Cell Phones in the Classroom: Learning Tools for the 21st Century* http://www.youtube.com/watch?v=aXt_de2-HBE&feature=related.

Students' responses and analysis

The post-questionnaire and group interview was done to get student teachers' reactions to the use of SMS and the researchers compiled a summary and discussed student teachers' responses. Individual and group interviews enabled the researchers to get participants' feedback concerning the use of the SMS as a tool for learning and to understand the interaction, engagement and collaboration established during the trial study development. The researchers also availed an offline video from your tube that demonstrated on how students could engage and interact in classroom activities using SMSs.

One student had this to say about SMS trial, "SMS is personal, mobile and flexible and is low-tech, universal and accessible". The mobile phone used as a pedagogical tool for learning, allowed distant student teachers to ask questions within the sms-group. SMSs allowed student teachers to learn when it was most convenient, it also increased students' motivation for the course and promoted the improvement of mobile phone use. The responses also showed the students' great

satisfaction in performing tasks that made the process of learning and teaching more effective and they recognised the educational potential of mobile phone (Ramsden, 1992).

Pedagogical principles, such as the creation of a learning environment that encourages independence, control and active engagement (Ramsden 1992, p. 101) create the context for the effective and efficient implementation of blended learning environments. Providing a focus on discursive, active and collaborative learning aimed to engage students, Field (2005) endorses the complement of face-to-face environments enhanced by mobile phones.

One student participant said "Some of the students are dropping out because of lack of support, motivation and others feel left out or lost on what to do, but this SMS intervention is a relief at least we can use it to ask for help from others. The community again does discourage us as to the value of these distance courses, the SMS engagement and interaction will enable us to have faith with BUSE."

CONCLUSION

Research has shown the effectiveness of SMS for increasing interactions and engagement amongst distance education students, the VODL students also appreciated this emergent technology that has demonstrated, as discussed earlier that it increases interaction amongst students and between students and lecturers. The feeling of isolation and feeling of being left out was reduced as was mention in literature as well by the participating students.

Though there are reports of wider network coverage in Zimbabwe, some students claim to have challenges of poor network reception. The greatest challenge that the research and VODL students have identified was the cost of sending text messages especially in developing countries as there is no free SMS portals. Some students raised the issue of undelivered SMS due to poor network reception and out of reach members. Group SMS Text messaging box will fill up in no time if everyone will send text messages to all members. This stops other incoming messages to be delivered promptly,

The above challenges can be eliminated by engaging with mobile phone network providers lobbying for reduction or toll free sms services to universities or downloading free sms software. This can reduce the cost on the part of both the researchers and participants. Students need to be made aware on how to manage their data on their mobile phones, by deleting messages that do not really need future referencing. Students can also create folder in their inboxes to store important SMSs and could use memory card to store messages they need for future reference.

Tina et al (2011) raised the issue on the feeling of isolation and alienation by distance learners due to lack of interaction and communication with fellow learners, tutors and the university administrators calls for higher level of support to the learners on a regular basis and unobtrusively thereby engaging them psychologically by motivating them.

The feedback from student teachers showed that SMS could contact each more actively/interactively. SMSs could help them keep in contact with any group members or individual immediately and can text for help and advice without being embarrassed or fear of being ridiculed by others. One student stated that the SMSs helped them to gain insights that the books alone could not bring from such distances.

As the mobile phones are cheap, and there is extreme interest in utilising them resulting in increases of interactions and engagement hence improved learning and student retention as they can exchange information at any time. Challenges on understanding of difficult concept and satisfying a variety of learning styles, needs, abilities and interests of students to use critical thinking skills are lacking in the VODL students. The summative evaluation of the SMS initiative has consistently shown that learners appreciated the text messages and felt that the SMSs had helped them to stay focused and engaged in their studies.

The students felt that using SMS will reduce the cost of travelling to BUSE, because they can use SMS if they had any queries. Some students felt that though the SMS helped increase interaction and engagement, they were not able to share media files, diagrams as it only offered texting only.

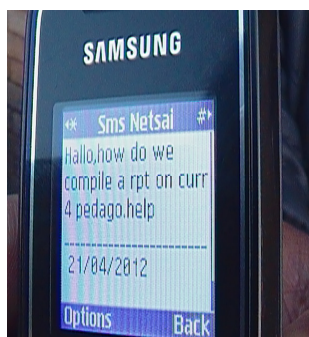


Image 1: SMS received



Image 2: Participants of SMS pilot project.

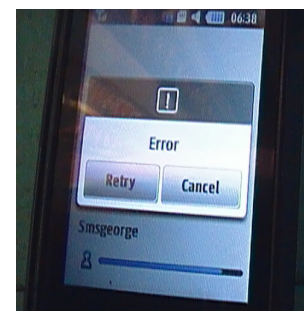


Image 3: Group SMS sending error message

RECOMMENDATIONS

1. A BUSE policy to integrate SMS technology as a tool that helps increase interaction of VODL student teachers and their lecturers.
2. The University to engage in negotiations with mobile phone network providers to offer reduced SMS costs to students and come up with better modalities for educational institutions.
3. University to set up SMS portal so that students can engage on a larger scale.
4. Further investigation on m-learning tools that use audio and visual file content sharing that can be accessed by these distant student teachers who have challenges of connectivity.
5. BUSE could setup rural ICT satellite centres in district offices, where students could have access to other mobile learning facilities thereby reducing the distance students have to travel.
6. Lecturers need to go on staff development on the use of constructivist learning approach and emergent technologies, to help equip them with 21st teaching strategies.

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