Bridging the Distance: The Pedagogy of Mobile Learning in Supporting Distance Learners

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1. Introduction

The challenge of the University of South Africa (UNISA), as the largest distance education institution in Africa, is to come up with innovative ways of supporting students who are not only geographically isolated from their teachers as sources of information, but also separated from their peers as sources of support. The effects of such isolation on distance learners can inhibit any possibility for engagement with teachers, study material and peers[1]. In distance education, the educational process is usually reduced from a dialogue to a monologue where a teacher sends out study material to the students. The assumption is that distance learners, do not need mediation or support as they go through their study material. Thorpe[2] argued that "course materials prepared in advance of study, however learner-centred and interactive they may be, cannot respond to a known learner". One of the main barriers of learning in distance education is the absence of interaction with other human beings in a learning environment. For these students, learning is most successful when people interact with each other through interrogating and sharing their description of the world[3]. Mediated Interaction is central to any educational experience irrespective of whether the students are studying through distance or not[4]. The problem arises when interaction between a lecturer and a student is not as constant as that which exists in a conventional face-to-face situation. The incorporation of mobile technologies, such as cell phones, in education can address this need because they can enable interaction between a student and the lecturer, as well as between a student and her or his peers.

The key to the successful enactment of interaction in distance education, according to Evans and Nation[5] does not rest with the way the course is designed, delivered and assessed or on the media used, "but it rests on the philosophy of distance education which informs the decisions about techniques and technology" (p154) that supports and enhance interaction in distance education. The idea of using cell phones for education is premised on building on

informal learning that most students are familiar with to develop formal learning opportunities for distance education students. The potential for using cell-phones in bridging the distance is enormous in a country of limited access to electricity and telephone networks; poor roads and postal services; and fewer people who have expertise of using computers. These limitations have lead to the rapid growth of wireless technology. Over the last ten years, cell phone users in Africa have increased at an annual rate of 65% - twice the global average[6]. In South Africa alone, the cell phone penetration is estimated at 98 percent. More than 90 percent of UNISA students own or have access to a cell phone that can be used in education for collaboration, tutoring, research, reading and writing purposes.

Although many technologies have been used in the past to enhance interaction in distance education, Keegan[7] argues that "it is not technologies with inherent pedagogical qualities that are successful in distance education, but technologies that are generally available to citizens" p3. Throughout the history of distance education, researchers and theorists have been involved in finding ways to bridge the distance between the students, their lecturers and their peers. Using cell phones is much more suited in supporting distance learning because it can reach those students who do not have access to other technological devices. A recent survey found that 39% of urban South Africans and 27% of rural residents are now browsing the internet from their cell phones[8]. Cell phones are more accessible to most rural communities in terms of cost, geographic coverage and ease to use.

The aim of this paper is to investigate the pedagogic approach that best support effective use of cell phones in the distance education context. It will draw on the integration of the distance education theories to argue for the principles that guide pedagogy and practice in using cell phones for the purpose of supporting distance education students. In this paper, distance education pedagogies will be mapped according to Moore's student-student; student-content and student-student interaction principles. Interaction is meant to provide cognitive, affective and systematic support to students in an education environment[9]. The success of any distance education system is based on three principles: "excellent (learning) and teaching material, high quality student support services and efficient logistical systems"[10] p218. Out of these three areas, student support services are widely considered as critical in the success of distance education programmes. Studies have shown that proper provision of student support services may break learners' isolation and meet not only the academic demands of students in distance education but also their social needs [11,12,13].

2. Context of student support at UNISA

Central to student support is a mediated conversation between the students and the teacher through integrated and structured dialogue in the study material and in other interventions aimed at formative development of a student[14,15]. The issue of limited student support as problematic in distance education was highlighted in several South African policy documents[16,17]. The student support programmes that are in place at UNISA appear to support limited number of students who live in select urban areas, thereby neglecting the majority of the student body who live in rural areas. In most cases, the student services are

in the form of face-to-face tutorials that are optional and depends on the number of students who take the initiative to organise contact sessions.

The challenge of UNISA is to identify mechanisms and intervention strategies that can support its 280 000 students who are dispersed in different parts of the country, the continent and the world. Students, no matter how far they are from the institution, need to be involved as active partners in the learning process. By and large, distance education requires and assumes that autonomous students do not need help from their lecturers. Students will always need guidance about course choice, study skills, access to group learning in informal small groups or tutorials offered by their lecturers[18]. The concept of learner autonomy as espoused by Wedemeyer is incongruent with the type of learning that most students are familiar with. A majority of students who enrol in distance education programmes came into higher education with expectations of past schooling where learning was directed and controlled by the teacher. When they are thrown into distance learning, where they are expected to work alone, they feel lonely, insecure and alienated. This problem is further exacerbated by the fact that many distance education students do not study through the medium of their first language. Although a majority of them choose to study in English, they lack fluency in the chosen language to cope adequately with academic work.

To address these concerns, UNISA has a network of community learning centres that provide a place where people can meet, attend weekly classes, participate in discussion groups, study, pick up books and other materials for learning. Unfortunately, students, who live in remote rural areas to not have access to these services because most of the learning centres are located in urban areas. Where it is not possible to offer face-to-face tutoring, tele-tutoring video, and computer-conferencing with lecturers is also used as well to support a two-way communication between the teacher and the learner. UNISA is also using Learning Management System - MyUnisa, to provide interaction and technological resources that supports all areas of teaching and learning. The multimedia approach that UNISA uses is much more effective than using one method of delivery. Despite well-meaning efforts of distance education providers, a majority of students still find it extremely difficult to adjust to and succeed in distance education.

An effective student support service in distance education is characterised by responsiveness to students' needs, that is, it personalises the learning process; it encourages and facilitates interaction between students and stakeholders; it facilitates learning within courses and "it evolves continuously to accommodate new learner populations, educational developments, economic conditions, technological advances and findings from research and evaluations"[19]p45. The emphasis, according to Thorpe[20], is on the student needs not on the content of the study material. Simpson[21] describes student support in terms of its activities beyond the production and delivery of course material. He divides student support services between academic and non-academic support. The former is concerned with developing cognitive and learning skills whereas the latter deals with the affective and organisational aspects of students' studies. The purpose of student support in distance education is to meet the needs of all learners[22].

The distance education character of individual form of learning and the absence of communication is a challenge for both students who need help and lecturers who want to assist students in cognitive development. Thorpe[23] believes that the quality of the interactivity between a student and his peers, a student and his teacher, and a student and his or her counsellor may enhance and even influence reactions to study. Keegan[24] argues that the incorporation of mobile learning can afford new opportunities for teaching and supporting students in distance education. Cell phones can be used to facilitate both synchronous and asynchronous communication to support and facilitate the process of interaction between individuals and groups in distance education context.

3. Theories of interaction in distance education

Interaction, according to Anderson[25] is the core of the educational experience. Without interaction, teaching becomes simply "passing on content as if it were dogmatic truth"[26] p 29. The nature of distance education compels providers to use mediated forms of this interaction to support their students. This enables students to communicate with their lectures and talk with each other in an effort to understand the course content. Interaction, according to Anderson[27], occurs when objects, events and people mutually influence one another. Through interaction, people become involved in a community of practice which embodies certain beliefs and behaviours to be acquired[28]. Vygotsky[29] argues that social interactions are methodologies that turn experience into knowledge, with language as a medium for negotiation of teaching and learning. Therefore, students' development is determined by social interaction through problem-solving under the guidance of a teacher or in collaboration with capable peers Vygotsky[30].

To understand how cell phones can be used for pedagogic purposes, it is important to look at interaction on the efficacy of distance learning. The main focus of the learning process should be based on a particular theory or theories that help to explain the functioning of people and institutions. Each theory of learning leads to an adoption of specific teaching and learning process. It is this regard that theories of distance education will be looked at in terms of supporting distance students. Keegan[31] classified theories of distance education into three groups: theories of independence and autonomy, theories of industrialization of teaching, and theories of interaction and communication. This study will focus on those theorists that dealt specifically with the role of communication or interaction in supporting distance students.

The character of good distance education, according to Holmberg[32], "resembles that of a guided conversations aiming at learning and that presence of the typical traits of such conversation facilitates learning." He argues that the study material that is developed with good didactic conversation in it should be written in a personal style; easily accessible; offer explicit advice and suggestions and invite exchange of views. The idea is to establish a personal relationship with the students and course developer and "find ways to non-contiguously cater for something functioning in the way that dialogue does"[33]p17.Central to student support is a mediated conversation between the students and the teacher through

integrated and structured dialogue in the study material and in other interventions aimed at formative development of a student. Iinteraction between the tutor and the student was done through student sending a completed assignment to the teacher who marks it and sends it back with comments and feedback. This system assumes that students have the ability to work through the study material independently. However, studies have shown that students seem to value contact with other people even when they study at a distance[34;35;36].

Holmberg[37] argues that the conversation concept can be successfully translated for use by the media available to distance students. Although the simulated conversation brought about by the presentation of the study material, the real or two-way conversation could be done through the written, personal and telephone interaction between the students and the tutors and others belonging to the supporting organisation. Keegan[38] defined distance education as a system characterized by 1) the separation of instructor and student during most of the instructional process, 2) the influence of an educational organization, 3) provision of student assessment, 4) use of educational media to deliver course content, and 5) two-way communication between instructor and student.

Moore[39] defines this distance in terms of the responsiveness of an educational program to the student rather than in terms of the physical separation of the instructor and the student. He argues that distance education, not only a geographic separation between the teachers and the learners, is a pedagogic concept. This separation affects the patterns of teacher and student behaviour. In this separation there is a "psychological and communications space to be crossed, a space of potential misunderstandings" between instructors and students who are physically separated[40]p22. It is in this space, that Moore describes as transactional distance, where the structure of the educational program and the quality of the interaction between the teacher and the student determines academic performance.

In his theory of transactional distance, Moore[41], argued for the relationship between dialogue (the interaction that occurs when one gives instruction and the others respond), structure (teaching strategies and evaluation methods), and learner autonomy (the ability of the student to take responsibility of his or her learning). Transactional distance tends to be lessened in courses with high levels of dialogue and little predetermined structure because students receive ongoing guidance from instructors. But where there is a high structure and low dialogue, the responsibility of learning is on the students. Moore believed that interaction should be both unidirectional and bi-directional in distance education. It should serve a variety of purposes including encouraging interaction between student and content; student and student; and student and lecturer. "Deep and meaningful formal learning is supported as long as one of the three forms of interaction (student-teacher; student-student; student-content) is at a high level"[42].

Anderson and Garrison[43] took Moore's types of interaction a step further by including the teacher-teacher, teacher-content and content-content interaction. They argued that teaching and learning is not only about students, it also includes other forms interaction that takes place in distance education. This model presents a shift from focusing on the student to

looking at the entire distance education system[44]. While Moore looked at interaction from a students' point of view, Anderson focused on the educational phenomenon of interaction from the multiple-perspectives. In developing this framework, Anderson was seeking to clarify the costs between independent-oriented and interactive-oriented learning strategies and activities. "He stressed the importance of cost and sustainability as well as pedagogical value in choosing appropriate mixes of interaction"[45]. From Anderson model, it is clear that there are many types of actors (both human and inanimate) and a variety of interactions

Most of the interaction that takes place in the distance education environment is often mediated by technologies. In introducing the fourth type of interaction, learner-interface interaction, Hillman, Willis, and Gunawardena[46] argue that student should have the skills and the necessary competencies that will give confidence in operating the mechanisms of the delivery system before they can successfully interact with content, the lecturer and other students. "What is known lies in the interaction between individuals and artefacts, such as computers and other technological devices"[47]p30. The successful implementation of learner-interface interaction, according to Hillman et al.[48]requires the student "to operate from a paradigm that includes understanding not only the procedures of working with the interface, but also the reasons why these procedures obtain results"p34. It is therefore important that students understand why they are using cell phones in an educational environment in order to interact successfully with content, lecturers and peers.

The use of technology is an essential component of supporting two-way communication in the education transaction[49]. The mediating role of information and communication technologies such as cell phones places the student at the centre of learning. Garrison's concept of learner control is based on the students' "ability to influence and direct a course of events"[50]p27 within a distance education environment. He believes that a two-way communication can only be sustained if students are also in control of the educational transaction. In this context, according Garrison[51], a student assumes responsibility for constructing meaning is an interactive environment. Mobile learning, by nature tends to ascribe to the student-centred approach which aims to develop in each student a sense of responsibility for his or her own learning by focusing on individual student's experiences, perspectives, background, interests, capabilities and needs. Garrison's[52] concepts of dialogue, structure and control are central to his two-way communication framework.

These selected theorists were concerned with explaining the functioning of the concept of interaction in enhancing and supporting learning in distance education. This shows that the potential to use cell phones in facilitating interaction is enormous and can be used in a variety of ways. Cell phones can be used as a tool to provide both synchronous and asynchronous support to learning. Cell phone social networks such as MXit can be used to facilitate the process of real-time communications between individuals and groups[53;54]. These devices can also be used by the teacher to stimulate discussion amongst students by sending a question via SMS. The idea is to find an accessible and available technological tool that can be used to support South African distance education students.

Theoretical framework	Main characteristics	Pedagogical focus
Guided didactic conversation[55].	Conversation character of the written pre-produced course package Real and simulated conversation	Study material should be written in a personal style; easily accessible; offer explicit advice, suggestions and invite exchange of views. Mediated conversation facilitates the development of learning relationships between the lecturer and the student
Transactional distance [56;57;58].	Dialogue – two-way communication; interaction Structure - teaching strategies and evaluation methods Learner autonomy Learner-interface interaction	Learner – lecturer :The lecturer provides an organised curriculum to ensure that the student masters the content Learner – learner: Students form peer support groups Learner-content : Student reads a book, views or listens to DVDs and CDs and interacts with inanimate learning resources. Learner-interface: interaction between the student and the technologies used to deliver the instruction
Two-way communication [59].	Dialogue, Learner Control Two-way communication	The course is designed and developed using networks of diverse mobile applications to support two-way communication. Students are empowered to control process of learning
Equivalency Theorem [60].	Interaction from the multiple-perspectives including teacher-teacher, teacher-content and content-content interaction. Costs of interaction	Focus is on the entire distance education system that includes interaction within the content and among teachers, course developers, instructional designers, administrators etc.

Table 1. Pedagogical focus of theories of interaction

4. Implication for practice

All these theories that have been mentioned in this study were trying to provide direction and new approaches that can be used to bridge the distance associated with the correspondence nature of distance education. Distance education has always been challenged by the problem lack of communication in the education transaction. Therefore, the distance education theory "must reflect purposeful and spontaneous nature of an educational experience"[61]p2. Many theories which looked at the challenge of interaction in distance education agreed that students need to be supported both cognitively and affectively through mediated technologies and face to face intervention. An effective student

support services in distance education should address student needs as they first enquire about the courses to studying (independently or assisted) and finally to graduating. During this process student support resources should be geared towards supporting students':

- Cognitively – by developing study materials through mediation.
- Affectively – by providing an environment which supports students, that creates commitment and that enhances self-esteem.
- Systematically – by establishing administrative and information management systems that are effective, transparent and student friendly[62]p289.

In distance education, students are physically, emotionally and socially separated from the institution. To help us address this challenge, the analysis in this study will use Moore's concepts of student-content interaction; student-lecturer interaction; and student-student interaction as a guiding framework to suggest how cell phones can be used to support students cognitively, affectively and systematically. The aim is to find the best pedagogical principles, that is, strategies, techniques and styles used to assist distance education students to learn[63]. Anderson and Dron[64] describe the usage of technologies and pedagogy as the two being intertwined in a dance: "the technology sets the beat and creates the music, while the pedagogy defines the moves". This means, according to Anderson[65], technology can influence the type of pedagogy that fit into a specific model that a technology can support. The availability of technologies to support different models of learning strongly influences what kinds of models can be developed. The nature of mobile technology is such that it has the ability to support situated learning which a critical component of social interaction is[66]. Effective mobile learning provides a platform where students can access relevant information while studying collaboratively. The technology – the cell phones affordances encourages the development of pedagogies that support collaborative learning.

5. Student-content interaction

Studying through printed media will remain one of the main medium of instruction in most developing countries such as South Africa. The pre-produced self-contained study materials are developed with an explicit understanding that they facilitate access to learning. Holmberg[67] argues that the study material that is developed with good didactic conversation in it should be written in a personal style; easily accessible; offer explicit advice and suggestions and invite exchange of views. Traditionally, students go through pre-packaged and submit assignments and the lecturer provides feedback though tutorial letters and marked assignments. In recent times, different technologies have been used to enhance student-content interaction through automated testing, simulations and computer assisted instruction. These methods of independent study are meant to maximise student-content interaction.

In distance education, Holmberg[68] believed that course material should be developed in such a way that the conversation is internalised and the "student will be more motivated and more successful than if the course studies has an impersonal textbook character" The idea is to facilitate access to conversation which is meant to support motivation. To ensure

that students do not feel left out, study materials and assignments should be designed in such a way that students are encouraged to analyse, summarise and draw conclusions on the content of the study material[69]. He believes that self-check exercises as well as frequent submission of assignments and extensive feedback increase motivation.

5.1. Supporting student cognitively

Cell phones can also be used to enhance student-content interaction through weekly self-assessment quizzes. Through these quizzes students can test themselves on basic factual information. This will also encourage students to pace themselves as they go through their study material. Cell phone downloadable audio files can also be utilised to add a voice and provide a narrative to the content. The combination of printed study material, cell phone based self-assessment quizzes and audio can guide a student through the maze of learning while assisting them to pace themselves.

5.2. Supporting students affectively

Since cell phones offer support that is immediate, convenient and personal, most students tend to look forward to receiving messages from their lecturers and the university. In a study conducted by Nonyongo[70] and colleagues, UNISA students remarked that receiving SMS feedback on the content of the material made them feel that someone cares and they belong to the institution. Traxler and Dearden[71] used SMSs to deliver content such as hints, tips, revision etc. as well as to remind Kenyan teacher education students about their assignments and assessments.

5.3. Supporting students systematically

The issue of the geographic distance was reported as problematic by most of UNISA's distance education students, especially those who live in rural remote parts of South Africa. Most of them felt that they are physically cut-off from the university's resources. They have problems contacting administrative staff, obtaining study materials and borrowing library books. To address this problem, the University of Pretoria in South Africa used cell phone asynchronous academic intervention systems such as Instant Voice Response (IVR) system through which "students can phone a Frequently Asked Question (FAQ) number and receive answers from a pre-programmes system" [72]p225. Through these systems, students' administrative questions were answered. The University of Pretoria also use a cell phone system that enables students to register[73].

6. Student – lecturer interaction

The role of the lecturer in any education transaction is to encourage students through asking questions, correcting misperceptions, offering assistance, stimulating discussion and utilising technology to communicate. In distance education, the student-lecturer interaction is generally low. The lack of contact and limited feedback from their lecturers is of great concern for

distance education students. Most of them do not have the confidence to learn independently and a result they have trouble in self-evaluation. To encourage two-way communication, a variety of technologies such as telephones, computers, electronic mails have been integrated into the delivery of the study material to provide the missing interactivity[74]. It was reported that the direct student and lecturer conversation through telephones and computers have been used successfully in most developed countries. However, the lack of access to technologies such as computers and telephones was attributed as the reason why these technologies are not adopted for teaching and learning purposes in most developing countries including South Africa. By so doing, they ignore thousands of mobile technological devices that are in the pockets and schoolbags of thousands of students.

Students need some kind of contact with their lecturers as they learn. The portable nature of mobile technologies enables students to learn anywhere, anytime and at any place thus enabling them to contact their lecturer anytime they feel the need for support[75]. Mobile technologies by nature ascribe to student centred approach which empowers students and enhances lecturer's ability to clarify and challenge students ever changing base of knowledge. In this approach, the lecturer's role shifts from the custodian of knowledge to the facilitator of information.

6.1. Supporting students cognitively

Cell phones can be used as a tool to facilitate dialogue through synchronous and asynchronous learning. The lecturer can send questions to students via different types of cell phone messaging systems, i.e. twitter, MXit, WhatsUp, SMS etc. Through the development of the concept of mobile audio Wikipedia, Ford and Leinonen[76] used SMS and text-to-speech technologies to enable access to information using voice. Students who participated in this study were able to capture information; take photos; compile slide presentation; record and store information. These tools allowed students to interact with their lectures using multiple formats that cell phones have to offer. These formats can enable students to work on activities within the study material and briefly send a message to the lecturer reporting on how he or she went about doing the assignment.

6.2. Supporting students affectively

The use of cell phones in education offer offers a more interactive education encouraging critical thinking, communications skills, and flexibility for both students and teachers. Students need lecturers to help them complete courses on time and support them when stress becomes a problem[77]. This problem can be mitigated through motivational SMS messages. In distance education, there is strong correlation between care and learner motivation. To keep students motivated, lecturer should send students feedback almost immediately because students rely on lecturers comments on their assignments.

Many students have doubts about their capabilities of knowing whether or not they are on the right track, feedback, especially the one they receive almost immediately motivates them and gives them strength to continue. Motivation is also affected by the comments made by

their lecturers. To address this challenge of feedback, comments can be sent to individual students through SMS texting. Students can also be encouraged to use different types of platforms to communicate with the lecturer. A lecturer can periodically post a topic for discussion and assist students as they go about with their learning. Distance education need to feel the presence of the lecturer. When the lecturer send information via personal and situated devices such as cell phones, students feel supported, they develop a positive relationship with their lecturers and the university and they find learning more pleasurable and this in turn supports their motivation.

6.3. Supporting students systematically

In distance education, lecturers are expected to provide an organised plan and curriculum and communicate with the students via tutorial letters, emails and telephonically throughout the process of learning. To ensure that students are engaged in this process, a lecturer can encourage students through assessment exercises which can be sent to the university and be automatically marked and the results could be sent back to students through cell phones. This immediate and personal feedback is possible through the use of cell phones. Lecturers, on the other hand, could go through the students' responses and identify the problem areas that may need more clarification. The university can also develop a variety of cell phone applications to enhance feedback to students.

7. Student-student interaction

To most students, learning is a social process whereby a student feels the need to interact with fellow learners. This is significant in the learning process because the student need to be active in learning interaction in collaboration with other people. To address the problem of isolation, most UNISA students reported that they belonged to informal study groups even though this is neither encouraged nor discouraged by the university. It is in these study groups that students adopt a communal approach to learning by sharing responsibility for reading and explaining course material[78]. Through these groups "students can feel immediate identification with others in their group and so lose feelings of isolation and over anxiety" [79]p84. In most African cultures, group interaction is a strong factor determining values and social interaction. It is in these study groups that students adopt a communal approach to learning by sharing responsibility for reading and explaining course material[80]. The notion of helping each other is based on the South African traditional concept of 'ubuntu' meaning "humanity to others" which espouses collectivity and harmony. Learning in support groups is embedded in cultural beliefs and practices. That's why these students become extremely lonely when they are expected to learn independently.

7.1. Supporting students cognitively

To help the informal study groups to become self-sustaining, cell phone social networks such as MXit can be used. This instant messaging application was used successfully to facilitate the process of real-time text chat between students. Through this network students

were able to work together on projects and assisted each other[81]. The use of MXit is uniquely situated to support distance education students because they are already familiar with it. Lecturers can post a topic for discussion amongst students via SMS and students can get into MXit and work together on a problem or discussion.

7.2. Supporting students affectively

Through this network, students formed study groups where they were able get together, engage in joint activities and discussions, help each other share information about the course. Communities develop their practice through problem solving, requests for information, coordination and discussing developments, mapping knowledge and identifying gaps. People engage in the communities of practice to interact with each other and learn together [82]. It is through collaborative activities that students adopt a communal approach to learning by sharing responsibility for reading and explaining course material[83].Through peer support groups, students are more likely to be motivated to share their work with each other. When students are in control of their learning, they are able to link up with other students as illustrated above to form collaborative learning networks. Mobile learning facilitates this process through building communities of learners who are committed to work together to achieve a goal. By so doing, "students were able feel immediate identification with others in their group and so lose feelings of isolation and over anxiety"[84]p365.

7.3. Supporting students systematically

Universities may do well by facilitating the process of helping students form study groups through social networks that are developed by the university. They can also ask students to send in their profiles so that they can link them up with other students. The advantage of the social network, students do not have to be at the same location or in close proximity with each other.

8. Conclusion

Despite several studies that proved that mobile learning can be used to enhance learning, the use of these devices should not be seen as a panacea to support distance students. The success of using this technology should be based on its affordances, that is, its ability to enhance interaction in education. The multimedia functionality of cell phones and its simpler and user-friendly interface make cell phone easier to be used by people who may be uncomfortable with using other technologies such as computers. However, cell phones' limited ability to carry large chunks of information due to screen size can make it impossible to support certain types of pedagogies. Despite this limitation, young people are already inventing ways to use their phones to learn. It is this enthusiasm from young people that we need to exploit for the benefit of supporting distance education students. Therefore, cell phones should not be used on their own as a delivery tool for study material, they should be used to support printed study material, online learning and other forms of teaching

resources. Besides being affordable and accessible, the use of cell phones can provide opportunities for support in distance education context. The incorporation of cell phones in education can afford new opportunities for teaching and supporting students in distance education especially in developing countries such as South Africa. The biggest challenge of distance education institutions is to come up with ways in which teachers can be empowered with the necessary skills in order to fully utilise the affordances of mobile technologies to engage and support students in the learning processes.

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9. References

[1]   Simpson O. (2002) Supporting student in online, open and distance learning. Kogan Page, London.

[2]   Thorpe M. (2001). Rethinking Learner Support: the challenge of collaborative online learning, A paper presented at SCROLLA Symposium on Informing Practice in Networked Learning, Glasgow, 14 November 2001. Cited March 20, 2008. Available from http://www.scrolla.ac.uk/papers/s1/thorpe_paper.html

[3]   Sharples M.(2002) Disruptive devices: mobile technology for conversational learning, International Journal of Continuing Engineering Education and Lifelong Learning, 12(5/6), 504-520

[4]   Garrison R. (2000). Theoretical challenges for distance education in the 21st century: A shift from structural to transactional issues.International Review of Research in Open and Distance Leaming, 7(1). Cited March 20, 2008, Available from http://www.irrodl.org/content/v 1.1 /randy.html

[5]   EvansT. D., Nation D. E. (1989). Critical reflections in distance education. In T. D. Evans & D. E. Nation (Eds.),Critical reflections on distance education (pp. 237–252). Brighton: Falmer Press.

[6]   Rao M. (2011). Mobile Africa Report: Regional Hubs of Excellence and Innovation, Mobile Monday. [cited December 20, 2011] Available from http://www.mobilemonday.net/reports/MobileAfrica_2011.pdf

[7]   Keegan D. (2005). The incorporation of mobile learning into mainstream education and training, proceedings of the 4th World Conference on Mlearning, Cape Town, 25-28 October [cited 2January 25, 2008] Available from http://www.mlearn.org.za/CD/papers/keegan1.pdf,

[8]   Rao, M. (2011). Mobile Africa Report: Regional Hubs of Excellence and Innovation, Mobile Monday. [cited December 20, 2011], Available from http://www.mobilemonday.net/reports/MobileAfrica_2011.pdf

[9]   Tait A. (2003). "Reflections on Student Support in Open & Distance Learning", International Review of Research in Open and Distance Learning, vol. 4, No1, p.2-8.

[10] Rumble, G. (2000). Student support in distance education in the 21st century: Learning from service management, Distance Education, 21(2), 216-235.

[11] Brindley J.E., Paul R. (2004). The role of learner support in institutional transformation - A case study in the making. In J. E. Brindley, C. Walti, & O. Zawacki-Richter (Eds.), *Learner support in open, distance and online learning environments*, Oldenburg: Bibliotheks- und Informationssystem der Universität Oldenburg: 39-50.

[12] Rumble G. (2000). Student support in distance education in the 21st century: Learning from service management, Distance Education, 21(2), 216-235.

[13] Tait A. (2003). "Reflections on Student Support in Open & Distance Learning", International Review of Research in Open and Distance Learning, vol. 4, No1, p.2-8.

[14] Holmberg B. (1983). Guided didactic conversation in distance education. In D. Sewart, D. Keegan, & B. Holmberg (Eds.), Distance Education: International Perspectives (p. 114-122). New York: St. Martin's Press.

[15] Thorpe M. (2001). Rethinking Learner Support: the challenge of collaborative online learning, A paper presented at SCROLLA Symposium on Informing Practice in Networked Learning, Glasgow, [cited 14 November 2001], Available from http://www.scrolla.ac.uk/papers/s1/thorpe_paper.html

[16] Department of Education (DoE) (1998) Criteria for quality distance education in South Africa: Policy statement, Pretoria, Centre for Educational technology and Distance education

[17] Council on Higher Education (CHE) (2004). Enhancing the contribution of distance higher education in South Africa, Pretoria, Council on Higher Education

[18] Thorpe, M. (2001). Rethinking Learner Support: the challenge of collaborative online learning, A paper presented at SCROLLA Symposium on Informing Practice in Networked Learning, Glasgow, [cited 14 November 2001], Available from http://www.scrolla.ac.uk/papers/s1/thorpe_paper.html

[19] Brindley J.E., Paul R. (2004). The role of learner support in institutional transformation - A case study in the making. In J. E. Brindley, C. Walti, & O. Zawacki-Richter (Eds.), *Learner support in open, distance and online learning environments*, Oldenburg: Bibliotheks- und Informationssystem der Universität Oldenburg: 39-50.

[20] Thorpe, M. 2001. Rethinking Learner Support: the challenge of collaborative online learning, A paper presented at SCROLLA Symposium on Informing Practice in Networked Learning, Glasgow, [cited 14 November 2001], Available from http://www.scrolla.ac.uk/papers/s1/thorpe_paper.html

[21] Simpson O. (2002) Supporting student in online, open and distance learning. Kogan Page, London.

[22] Thorpe, M. (2001). Rethinking Learner Support: the challenge of collaborative online learning, A paper presented at SCROLLA Symposium on Informing Practice in Networked Learning, Glasgow, [cited14 November 2001], Available from http://www.scrolla.ac.uk/papers/s1/thorpe_paper.html

[23] Thorpe, M. (2001). Rethinking Learner Support: the challenge of collaborative online learning, A paper presented at SCROLLA Symposium on Informing Practice in Networked Learning, Glasgow, [cited14 November 2001], Available from http://www.scrolla.ac.uk/papers/s1/thorpe_paper.html

[24] Keegan D. (2005). The incorporation of mobile learning into mainstream education and training, proceedings of the 4th World Conference on Mlearning, Cape Town, 25-28 October [cited 2January 25, 2008] Available from
http://www.mlearn.org.za/CD/papers/keegan1.

[25] Anderson, T. (2010). Interactions Affording Distance Science Education. In D. Kennepohl & L. Shaw (Eds.), *Accessible Elements: Teaching Science Online and at a Distance* (pp. 1-18). Edmonton: Athabasca University Press. [cited March 2012] Available from http://www.aupress.ca/books/120162/ebook/01_Kennepohl_Shaw_2010-Accessible_Elements.pdf

[26] Garrison, D. R., Shale, D. (1990). Education at a Distance: From issues to practice. Melbourne, FL.: Krieger.

[27] Anderson, T. (2010). Interactions Affording Distance Science Education. In D. Kennepohl & L. Shaw (Eds.), *Accessible Elements: Teaching Science Online and at a Distance* (pp. 1-18). Edmonton: Athabasca University Press. [cited March 2012] Available from http://www.aupress.ca/books/120162/ebook/01_Kennepohl_Shaw_2010-accessible_Elements.pdf

[28] Lave, J.,Wenger, E. 1991. Situated Learning, Legitimate Peripheral Participation, Cambridge, Cambridge University Press

[29] Vygotsky L.S. (1930/1978). Mind in Society: The development of higher psychological *processes*. Cambridge, M.A. Havard University Press

[30] Vygotsky L.S. (1930/1978). Mind in Society: The development of higher *psychological processes*. Cambridge, M.A. Havard University Press

[31] Keegan, D. (1986) Interaction and communication, (Chapter 6, pp.89-107). In Keegan, D., Thefoundations of distance education. Kent,UK.: Croom Helm.

[32] Holmberg, B (1983). Guided didactic conversation in distance education. In D. Sewart, D. Keegan, & B. Holmberg (Eds.), Distance Education: International Perspectives (p. 114-122). New York: St. Martin's Press.

[33] Holmberg B (1983). Guided didactic conversation in distance education. In D. Sewart, D. Keegan, & B. Holmberg (Eds.), Distance Education: International Perspectives (p. 114-122). New York: St. Martin's Press.

[34] Rumble G. (2000). Student support in distance education in the 21st century: Learning from service management, Distance Education, 21(2), 216-235.

[35] Tait, A. 2000. Planning student support for open and distance learning, Open Learning, 287-298.

[36] Thorpe, M. (2001). Rethinking Learner Support: the challenge of collaborative online learning, A paper presented at SCROLLA Symposium on Informing Practice in Networked Learning, Glasgow, [cited 14 November 2001], Available from
http://www.scrolla.ac.uk/papers/s1/thorpe_paper.html

[37] Holmberg, B. (1989). Theory and Practice of Distance Education. London: Routledge.

[38] Keegan, D.J. (1980). On defining distance education. Distance Education, 1(1): 13–36

[39] Moore, M.G. (1993). Theory of transactional distance, in D. Keegan (ed), *Theoretical* Principles of Distance Education, Routledge, London, 22-38.

[40] Moore, M.G. (1983). The individual adult learner. In . In Adult Learning and Education, ed. M. Tight, 153-168. London: Croom Helm.

[41] Moore, M.G. (1983). The individual adult learner. In . In Adult Learning and Education, ed. M. Tight, 153-168. London: Croom Helm

[42] Anderson, T. (2003). Getting the mix right: An updated and theoretical rationale for interaction. *International Review of Research in Open and Distance Learning, 4*(2) [cited April 10, 2008]. Available from http://www.irrodl.org/index.php/irrodl/article/view/149/708.

[43] Anderson, T.,Garrison, D.R. (1998). Learning in a networked world: New roles and responsibilities. In C. Gibson (Ed.), Distance Learners in Higher Education. (p. 97-112). Madison, WI.: Atwood Publishing.

[44] Anderson, T.,Garrison, D.R. (1998). Learning in a networked world: New roles and responsibilities. In C. Gibson (Ed.), Distance Learners in Higher Education. (p. 97-112). Madison, WI.: Atwood Publishing.

[45] Anderson, T. (2010). Interactions Affording Distance Science Education. In D. Kennepohl & L. Shaw (Eds.), *Accessible Elements: Teaching Science Online and at a Distance* (pp. 1-18). Edmonton: Athabasca University Press. [cited March 2012] Available from http://www.aupress.ca/books/120162/ebook/01_Kennepohl_Shaw_2010-Accessible_Elements.pdf

[46] Hillman, D.C. A.; Willis, D.J. and Gunawardena, C.N. (1994) Learner-interface interaction in distance education: An extension of contemporary models and strategies for practitioners, American Journal of Distance Education 8(2) 3-15.

[47] Dabbagh N. (2005) Pedagogical models for e-learning: a theory based design framework. International Journal of Technology in Teaching and Learning, v.1, n.1, p.25-44.

[48] Hillman, D.C. A.; Willis, D.J. and Gunawardena, C.N. (1994) Learner-interface interaction in distance education: An extension of contemporary models and strategies for practitioners, American Journal of Distance Education 8(2) 3-15.

[49] Garrison, D. R. (1989). Understanding distance education. New York: Routledge.

[50] Garrison, R. (2000). Theoretical challenges for distance education in the 21st century: A shift from structural to transactional issues. International Review of Research in Open and Distance Leaming, 7(1). Available from http://www.irrodl.org/content/v 1.1 /randy.html arrison, D. R. (1989). Understanding distance education. New York: Routledge.

[51] Garrison, D. R.,Shale, D. (1987). Mapping the boundaries of distance education: Problems in defining the field. *The American Journal of Distance Education, 1(3),* 7-13.

[52] Garrison, D. R. (1989). Understanding distance education. New York: Routledge.

[53] Butgereit, L. (2007). Math on MXit: Using MXit as a medium for mathematics education, [cited 4 March 2008} Available from http://researchspace.csir.co.za/dspace/bitstream/10204/1614/1/butgereit_2007

[54] Makoe M. E. (2010) Exploring the use of MXIT – a social network system to enhance learning for distance education, Open Learning Vol. 25, No. 3, November 2010, 251–257.

[55] Holmberg B. (1983). Guided didactic conversation in distance education. In D. Sewart, D. Keegan, & B. Holmberg (Eds.), Distance Education: International Perspectives (p. 114-122). New York: St. Martin's Press.

[56] Moore, M.G. (1993). Theory of transactional distance, in D. Keegan (ed), Theoretical Principles of Distance Education, Routledge, London, 22-38.

[57] Moore, M. G., Kearsley, G. (1996). *Distance education: A systems view,* Belmont, CA: Wadsworth.

[58] Hillman, D.C. A.; Willis, D.J. and Gunawardena, C.N. (1994) Learner-interface interaction in distance education: An extension of contemporary models and strategies for practitioners, American Journal of Distance Education 8(2) 3-15.

[59] Garrison, D. R. (1989). Understanding distance education. New York: Routledge. arrison

[60] Anderson, T., and Garrison, D.R. (1998). Learning in a networked world: New roles and responsibilities. In C. Gibson (Ed.), *Distance Learners in Higher Education.* (p. 97-112). Madison, WI.: Atwood Publishing.

[61] Garrison, D. R. (2000). Theoretical challenges for distance education in the 21st century: A shift from structural to transactional issues. International Review of Research in Open and Distance Learning, 1(1) [accessed 5 May 2008] Available from http://www.irrodl.org/content/v1.1/randy.pdf

[62] Tait, A. 2000. Planning student support for open and distance learning, Open Learning, 287-298.

[63] Bronack, S., Sanders, R. Cheney, A. Riedl, R.Tashner, J. Matzen, N. (2008) Presence Pedagogy: Teaching and Learning in 3D virtual immersive world, International Journal of Teaching and Learning in Higher Education, 20(1) 59-69.

[64] Anderson, T.; Dron, J. (2011) Three generations of distance education pedagogy, International Review of Research in Open and Distance Learning, vol. 12 (3).

[65] Anderson, T. (2009). *The dance of technology and pedagogy in self-paced distance education.* Paper presented at the 17th ICDE World Congress, Maastricht. Retrieved from http://auspace.athabascau.ca:8080/dspace/bitstream/2149/2210/1/The%20Dance%20of%20technology%20and%20Pedagogy%20in%20Self%20Paced%20Instructions.docx.

[66] Kukulska –Hulme, A.; Traxler, J. (200)5. *Mobile learning: A handbook for educators and trainers*. London: Routledge

[67] Holmberg, B. (1989). Theory and Practice of Distance Education. London: Routledge.

[68] Holmberg, B. (1989). Theory and Practice of Distance Education. London: Routledge.

[69] Holmberg B (1983). Guided didactic conversation in distance education. In D. Sewart, D. Keegan, & B. Holmberg (Eds.), Distance Education: International Perspectives (p. 114-122). New York: St. Martin's Press.

[70] Nonyongo, E; Mabusela, K; Monene, V. (2005). Effectiveness of SMS Communication between university and students. Available from www.mlearn.org.za/CD/papers/Nonyongo&%20Mabusela.pdf,

[71] Traxler, J.; Dearden, P. (2005). The potential for using SMS to support learning in organisations in Sub-Saharan Africa, proceedings of the Development Studies Association Conference, Milton Keynes, September 2005, Available from www.wlv.ac.uk/PDF/cidt-article20.pdf, 25/01/2008.

[72] Gregson, J. Jordaan, D. (2009) Exploring challenges and opportunities of m-learning within an international distance education programme. Mobile Learning: Transforming

the Delivery of Education and Training, M. Ally (ed). Athabasca University: AU Press:195-214.

[73] Hendrikz, J. (2006) Mobile phone technology as an instrument for student support in Africa, a paper presented at the Fourth Pan-Commonwealth Forum on Open Learning, Jamaica, 30 October – 3 November.

[74] Galusha, J.M. (1997) Barriers to learning in distance education. Interpersonal Computing and Technology: An Electronic Journal for the 21st Century, 5(3/4): 6–14. Available at http://www.infrastruction.com/barriers.htm

[75] Sharples M.(2002) Disruptive devices: mobile technology for conversational learning, International Journal of Continuing Engineering Education and Lifelong Learning, 12(5/6), 504-520

[76] Ford, M.; Leinonen, T. (2009). MobilED – Mobile Tools and Services platform for formal and informal learning, *Mobile Learning: Transforming the Delivery of Education and Training*, M. Ally (ed). Athabasca University: AU Press:195-214.

[77] Galusha, J.M. (1997) Barriers to learning in distance education. Interpersonal Computing and Technology: An Electronic Journal for the 21st Century, 5(3/4): 6–14. Available at http://www.infrastruction.com/barriers.htm

[78] Lentell, H., O' Rourke, J. (2004). Tutoring large numbers: an unmet challenge, International Review of Research in Open and Distance Learning, 5(1) www.irrodol.org/index.php/irrodol/article/viewArticle/171/253 (accessed 21 September 2008).

[79] Thorpe, M. (1995). Bringing learner experience into distance education in Sewart, D (ed.) *One world, many voices: Quality in open distance learning*: Selected papers from the 17th World Conference of the International Council for Distance Education, International Council for Distance Education and the Open University, Milton Keynes: Open University, 364-367.

[80] Lentell, H., O' Rourke, J. 2004. Tutoring large numbers: an unmet challenge, International Review of Research in Open and Distance Learning, 5(1) www.irrodol.org/index.php/irrodol/article/viewArticle/171/253 (accessed 21 September 2008).

[81] Makoe M. E. (2010) Exploring the use of MXIT – a social network system to enhance learning for distance education, Open Learning 25, (3), 251–257.

[82] Lave, J. and Wenger, E. (1991). Situated Learning, Legitimate Peripheral Participation, Cambridge, Cambridge University Press

[83] Lentell, H., O' Rourke, J. (2004). Tutoring large numbers: an unmet challenge, International Review of Research in Open and Distance Learning, 5(1) www.irrodol.org/index.php/irrodol/article/viewArticle/171/253 (accessed 21 September 2008).

[84] Thorpe, M. (2001). Rethinking Learner Support: the challenge of collaborative online learning, A paper presented at SCROLLA Symposium on Informing Practice in Networked Learning, Glasgow, [cited 14 November 2001], Available from http://www.scrolla.ac.uk/papers/s1/thorpe_paper.html