Increasing Undergraduate Throughput and Success Rate through Mobile Technologies: A South African Distance Learning Case Study

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Abstract

The purpose of this qualitative study was to unmask and explore the strategies for increasing undergraduate student throughput and success rate in open and distance learning (ODL) using mobile technologies. The research question: How can ODL institutions harness mobile technologies to increase undergraduate throughput and success rate? Provided the focus for the study. Data from the interviews were collected, digitally recorded and analysed using Collaizzi's (1978) data analysis framework. The frame work was chosen because of its ability to provide clarity in the steps of analysis and was followed by analysing the impact that mobile technology could have on increasing undergraduate throughput and success rate in ODL. The major findings of the study were that ODL should design new communication information technology intensive space that promotes the utilisation of various mobile technologies that could improve undergraduate throughput and success rates. The study also revealed that asynchronous technology and interactive learning resource materials made students to feel connected with their peers, e-learning strategy and use of mobile technologies.

Keywords: Throughput rate, mobile learning, mobile technology, student success, open and distance learning

1. Introduction

Even though there are several studies that have been conducted on undergraduate throughput and success rates in open and distance learning worldwide, there are still limited studies on the use of mobile technologies to increase throughput and success rate in distance education. In this study, throughput and success rate refer to the number of students who enrol in an education programme and who pass the examination at the end of the semester and at the end of the year. This study grew out of the critiques of the University of South Africa's (Unisa) low undergraduate throughput and success rates. Issues of low pass rate and throughput in undergraduate studies is always problematic in distance education. South Africa's graduation rate of 15% is one of the lowest in the world. Higher education also reflects broader inequalities, with the graduation rate for white students more than double that of black students. Notwithstanding the lower target graduation rates, improving throughput remains a priority to extent that the funding framework links funding to the number of graduates that an institution produces (Letseka, 2007). The study has chosen Unisa as a case study because it is the only single mode dedicated comprehensive university in South Africa that offers distance education to over four hundred students in Africa and the diaspora. This study therefore, explored the use of mobile technologies as a teaching and learning tool that could be utilised to increase undergraduate throughput and success rates in open and distance learning. Mobile learning is a kind of digital learning mode using wireless mobile communication network technology and devices such as smartphone, mobile electronic equipment, palm-laptop, etc. In this research study, mobile learning shall be limited on the devices which can be conveniently carried in one's hand and backpacks to accept education and training. Mobile technologies provide an affordable and easily accessible technology that lecturers can use effectively to assist undergraduate students to increase throughput and success rate in open and distance learning institutions (Traxler, 2006). More than ninety percent of Unisa's students own a mobile phone that has software features allowing them access to pictures, games, video, instant messaging and the Internet and as such it is appropriate to explore the use of these technologies for teaching and learning purpose which in turn would increase throughput and success rate. It is against this backdrop that the researcher argued that if properly utilised, mobile technologies are a perfect vehicle for increasing undergraduate throughput and success rate in open and distance learning environments.

2. Literature Review

A plethora of literature describes throughput and success rate in an ODL environment. Improvement of undergraduate throughput rates must be the key strategy for increasing graduate outputs, for skills available to the economy, and providing larger number of students available for post graduate study (Letseka & Maile, 2008). Student support at undergraduate level must be taken seriously as a vital and strategic activity of all universities. The South African government has raised serious concerns over the graduation rates, which it says is costing the national government a great deal in terms of resources because of the poor academic performance. How long it takes to graduate and who leaves a university without completing a degree are issues which matter to students and their families, to higher education institutions and to the government as the main funder of higher education. On the other hand, at institutional level, the funds that should have been used to improve educational programmes are wasted on admitting students who will never graduate. This culminates in the likelihood that an institution's public funding may be reduced if students do not complete their studies due to the concern that the funds provided did not yield the desired outcomes.

Keegan (2005) defines mobile learning as teaching and learning through the facilitation of mobile technology and its environment with portable devices such as smart phones and mobile phone. It offers opportunities for the optimisation of interaction between lecturers and students and among members of communities of practice (Brown, 2004). Studies conducted by Suplido, Bonito, Escubio, and Mariano (2003) to test the viability of using mobile technology in distance education provided evidence that mobile learning is helpful in increasing throughput and success rate in distance education. The use of mobile technology for education is much more potent in South Africa because it has the ability to connect less-privileged people to information. Suplido et al (2003) and Librero (2006) have identified four types of educational mobile-phone usage namely:

- The mobile phone and SMS is used as a course delivery tool, even to the point of being the primary medium for interactive learning of course content,
- SMS is also used to give lecture alerts (changes of schedule), schedules of focus group discussions, examination reminders, deadlines for projects and papers, new courses, grades, schedules for consultation, availability of library resources, and so on,
- In extracurricular contexts, student groups and organizations use the cell phone to promote activities such as job fairs, social affairs, and discount opportunities, and for text-voting during student council elections,
- In administrative contexts, the following details are readily available over the phone: university admissions, fees, availability of scholarship grants, marketing campaigns, alerts to parents and guardians on the students' performance, and emergency information such as bad weather alerts and suspension of classes.

In her study, Makoe (2010) found that the use of mobile technologies for teaching and learning cannot be sustained if teachers are not qualified and competent to use the tool in their work. They need to perceive mobile technology as an alternative platform for student centred learning approach. The challenge of open and distance learning institutions is to identify ways in which educators can be empowered with skills in order to fully utilise the affordances of mobile technology to engage students in the learning. Nevertheless, to enhance the throughput remains a priority. The lower graduation rates call for strategies to scale up undergraduate throughput rates in order to retain students in their programmes and enable them to complete their programmes. Mobile learning provides a particularly relevant example of ODL on the move and aims to provide 'educational moments' through lifestyle integration anytime, anyplace, anywhere-not just when away from one's desk, but also when actively moving around (Brindley & Paul, 2004).

According to Makoe (2010) distance education providers should take full advantage of the power of mobile technologies to enhance the learning experiences of their students. The potential of using mobile technology for educational purposes 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. The lack of infrastructure for electricity, computers, and telephones in some parts of South Africa has led to the rapid growth of wireless infrastructure. Given the proliferation of cellular mobile phones use across all sectors of South African society, it is increasingly evident that this highly mobile form of technology and infrastructure can be leveraged to deliver flexible-educational opportunities to more and more South Africans. Using a cell phone to enhance learning is practical because almost all learners have access to one, to either send or receive a text message. Currently about 95% of South Africa is covered by mobile network coverage and one out of every 5 people has a mobile phone and it is therefore proper to venture into the use of this technological gadget to provide distance education since it is cheap and affordable to many people. In South Africa less than 11 percent of the population owns a land-line telephone whereas 90 percent of the country's population has access to a mobile phone.

The cell phone, now the most widely used medium in South Africa, has major educational implications and has been argued to be an appropriate device for educational delivery in the so-called developing world. It is a low-power device that can be used in places without reliable electricity. Even though it is largely purchased for voice communication-which semi-literate users rely on for their social and economic needs-it is also able to run educational software that support visuals and voice-overs (Brown, 2003). While mobile technologies can be deployed in schools in developing countries, the greatest opportunity is to facilitate informal learning in out-of school environment so as to complement formal schooling. Mobile technologies can thus empower students in distance education to balance their educational and income earning goals, by enabling them to learn anytime, anywhere, in places and times more convenient than schools. Most educators still see the computer and the cell phone as unrelated devices, and the tiny cell phone more as a personal accessory, especially for young people (Librero, 2006). The use of mobile technologies is beginning to have a positive effect on teaching because it has an impact on student retention and achievement (Bates, 2000). With falling prices and increasing functionality, however, it is virtually certain that not far in the future all of the world's students will have a cell phone. In South Africa, for example, 99 per cent of distance students have access to a mobile phone, while only 0.4 percent has access to the internet (Brown, 2004). Through the support of mobile technologies, student throughput and success rates could be improved and the quality of learning experience enhanced. This is sufficient reason and motivation for distance education providers to explore the possibility of making a mobile technology an important tool in the educational systems.

3. Theoretical Framework

Theory teaches us what we know. Theory also tells us what we do not know and guides us in our research. According to Moore (1991, 1-6), "Research that is not grounded in theory is wasteful." Against this backdrop this study utilised Moore's (1991) transactional distance theory. This theory was regarded as the most suitable one for this study because the main reason for using mobile technology for teaching and learning is to reduce the transactional distance between the student and the educator. Furthermore, the theoretical framework was able to respond to the research question and the research objectives. Most recently, Moore has described it as: "The transaction that we call distance education occurs between individuals who are teachers and learners, in an environment that has the special characteristic of separation of one from another, and a consequent set of special teaching and learning behaviors. It is the physical separation that leads to a psychological and communications gap, a space of potential misunderstanding between inputs of instructor and those of the learner, and this is the transactional distance" (Moore, 1991, 1-6). It is in this space, that Moore and Kearsely (1996) describe 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 and success.

4. Research Methodology

The research methodology for this study was grounded in a basic qualitative research framework aimed at exploring and describing the utilisation of mobile technology to increase undergraduate throughput and success rate reduce in open and distance learning. Basic qualitative research was adopted for this study because of its ability to provide clarity on the steps that should be followed when collecting and analysing data. To understand how undergraduate throughput and success rate could be increased or improved through the use of mobile technology, a cohort of first-year students was used. The reason for choosing the first-year students was motivated by the high failure and drop-out rates of this group.

The participants were purposefully selected, that is, seven were coming from disadvantaged and marginalised rural communities and the other seven came from urban centres. These were students who registered for first-year signature modules in different disciplines. To get hold of these students the researcher went to on-campus student hub where he made arrangements to interview them firstly as individuals and as a group. To ensure that the study was conducted in accordance to the ethical principles, the researcher applied for an ethical clearance from the University of South Africa's Ethical Committee.

Furthermore, the researcher made use of the informed consent as suggested by Neuman (2000:352), (Kvale 1996:171-196). Based on Kvale's (1996) recommendations, the researcher developed a consent form indicating the following information: The purpose of the research, the consequences of the study for participants, the risk and benefits of the research, the participants' right to stop the research at any time, the procedures on how to protect the confidentiality of the interviewees, who will have an access to the interviews? How can the identity of the subjects be disguised? The voluntary nature of research participation.

To answer the research question: How can we harness mobile technology to increase undergraduate throughput

and success rate in open and distance learning? The researcher conducted semi-structured interviews which were digitally recorded and transcribed shortly after each interview. It was the intention of the researcher to interview as many participants as possible, but, since this was a qualitative study the researcher was limited to the use of about fourteen students only. The researcher conducted five individual interviews before saturation was reached, as this was evidenced by the participants' inability to come up with new information. However, in order to ascertain whether data saturation has been reached or not, the researcher conducted a further group-focus interview. Having explained the various stages of data-gatherings, the researcher analysed the data based on the interviews he conducted with the participants. Data were analysed through the use of Collaizi's (1978) framework. The following stages were employed to analyse data:

- Step one: reading the entire interview to get a sense of the whole
- Step two: the whole transcription was disseminated into several parts to determine the meaning expressed
- Step three: Relevant themes were clustered together according to meanings
- Step four: Descriptions were given back to the participants for verification
- Step five: In order to understand students' experiences the researcher had to move from individual description structure to the general description of situated structures.

It was through this process that several themes were identified from each participant and then clustered into a number of general themes that appeared to be common to all the participants' descriptions. The final step in data analysis involved an interpretation or meaning of data, and it was at this stage that the clustered themes and meanings were used to develop the textural descriptions of the participants. From the textural and structural description an integration of the meanings and essences of the phenomenon were constructed. This included making use of the verbatim examples from the transcribed interviews.

5. Discussions of the Study

The findings of this study were presented in terms of the participants' responses to the research questions that they shared with the researcher. On the basis of the data collected, recorded and analysed the following four important themes emerged: Mobile technology encourages student collaboration, provides student feedback, reduces isolation, and mobile technology is enabler to student support.

5.1 Student collaboration

The study found that mobile learning provides enhanced collaboration among students, access to information, and a deeper contextualisation of learning as shown in the following student's comment: "Some of us had set up our own self-help group. There were seven of us originally and six of us got together. At first it was slow going with no-one contributing until the last minute. It was a bit off-putting. I was expecting everybody to contribute right at the very beginning. I found nobody had contributed anything when I logged on each day." The evidence from the above quotations indicates that group work plays a very important role in student learning and success. Nearly all students felt they had gained something from the group discussion compared with individual assignments. It was also found out that some of the students had never experienced working with other students before, but, mobile technology made it possible.

5.2 Provides quick student feedback

A very consistent theme throughout the student participant responses was the importance of the feedback being given promptly. Phrases such as: "Within the recommended or suggested timeframe," "reasonably promptly," "within a short time-frame" and "shortly after the assignment [was submitted]" gave an indication that students often were anxious to receive feedback from instructors faster than otherwise it would have been if technology was not used.

5.3 Mobile technology reduces student isolation

Most of the distance education students are geographically isolated throughout the country and it became clear that engaging them is a challenge. Since the dawn of this new mobile technologies distance education students are becoming more and more able to communicate with each other with the result that the transactional distance that exists between the student and the educator, the student and the institution, student and student is drastically reduced. Even though it is believed that students in distance education are not easily brought together for this much needed engagement, the truth

is that they are communication without the involvement of the educator which ultimately helps them to discuss school related issues. Some of the students indicated that: "Internet and cell-phones have made our lives easy because we are able to help each other with our studies"

5.4 Technology as enabler of student support

Another theme which frequently came forward during data collection processes was that of using technology to support undergraduate students. Undergraduate student throughput and success rates in general in South Africa are an aspect of major concern. In particular, the throughput rates of distance education students because of their geographical isolation and lack of institutional support. The biggest challenge facing distance education institutions in South Africa today is to identify student support services that are appropriate and relevant to the South African context. It is important to note that students need to be involved as active partners in the teaching and learning processes and these processes should be facilitated through continuous support. Educationally, it is now a known fact that technology does more than overcome distance: its appropriate and relevant use could modify conditions for distance education learners to such an extent that they feel like they are in the traditional classroom. The idea for striving for replication of the traditional classroom did not occur accidentally in distance education, the traditional classroom setting has been touted as the optimum model to achieving teaching and learning. Higher education in general and educators at distance learning institutions in particular are constantly challenged to increase the effectiveness of their teaching by improving student retention and throughput. Most of the participants interviewed had shown that technology enhanced learning is important since it could make their work much easier. In this theme most of participants interviewed indicated that technology has completely changed the way teaching, learning and assessment has been done in distance education.

The following is one of the most colourful passages from the participants on this topic: "These days it looks like technology is a buzz word in distance education. Its' like there is a tsunami. Previously we used to receive learning materials using hard copies, but that is now changing because of these emerging mobile technologies. There is no way that teaching and learning cannot be affected by technologies. Few years ago students used to wait for weeks to receive learning materials because they were to be posted through the post office, there were no couriers like we have today, no cell-phones to alert us that learning materials are on the way, no internet, etc. Now you can down-load learning materials same day you register, what a change?" This explanation is very rich in meaning. The proliferation of technologies is seen as powerful and irresistible, and is happening very quickly.

There is a sense that the phenomenon (Tsunami-or arrival of information technology) is unstoppable. And even those that "swim against the tide" should expect to get "washed up" on the side of the new technologies eventually (rather than drowning), only those who have done nothing are expected to lose out entirely. This quotation indicates that the move towards the use of the new tools and methods is inevitable, and furthermore the statement indicates that those who failed to adopt this mobile technology would eventually be unable to continue teaching ("get washed away").

6. Findings and Implications of the Study

The world appears to be undergoing major changes to keep up with the digital revolution in motion. It is no wonder that education authorities are encouraging researchers to find ways of exploiting this plethora of mobile technologies for the delivery of teaching and learning. The aim of this study was to explore the possibility of using mobile technology, cell phone in particular to increase undergraduate throughput and success rate in open and distance learning. The study argues that effective student support using mobile technology is likely to lower the drop-out rate and increase the pass rate which is the very issue that South African distance education institutions struggle with. The findings indicated that mobile phones can be used as an effective and efficient tool for teaching and learning in distance education. The study found that there is relationship between academic readiness, the likelihood of success and the amount of support, preparation and perseverance required to achieve success. The study also revealed that mobile learning support tools could support populations previously excluded from traditional e-learning environment. In this study, 80% of the students contacted indicated that they are in possession of cell phones and they have found them to be viable instruments for teaching and learning. These students furthermore indicated that they did not have a problem in understanding the short message system (SMS) language used by the university when contacting them.

From the interviews conducted and analysed, most of the students who took part in the study had shown that they had benefited enormously from the use of mobile technology because it allowed them to communicate with their lecturers, peers and the institution at any given time and place. Most of the students contacted indicated that they had benefited so much from the use of the SMSs, while at the same time they also indicated that they would like to keep in

touch with their educators as often as is possible because this keeps them posted with their university work. The study also found out that the University of South Africa has explored the potential of mobile devices such as cell phones for educational purposes, specifically to alert student body about their courses. Furthermore, the study discovered that there were potential challenges the students could face such as irregular or unstable power supply to recharge their mobile phones.

Generally, the study also found that students were happy that the university has gone all out to provide them with the much needed support so that throughput and success rate could be improved and sustained. Again, the study found that students were interested in using mobile technology as an important study tool because it is affordable and easy to access. However, contrary to the positive usage of mobile technology for learning purposes, the study also revealed that students were more comfortable in the use of mobile technological equipment for social network purposes, e.g. chatting and playing games.

On the basis of the evidence provided, the use of mobile technology can enhance the learning experience of undergraduate students and consequently help them to be successful in their studies only if they are committed in using it for learning purposes. The implications associated with the use of mobile technologies was that mobile information communication technologies (ICTs) can facilitate cohort socialization or can serve as a support mechanism to encourage undergraduate students throughput and success rate in their distance education studies. Through the support of mobile ICTs the learner's throughput rates might be improved and the quality of the learning experience enhanced. Even though the above findings are mixed, the researcher remained cautiously optimistic about the future of mobile learning in open and distance learning.

7. Conclusion

This study was intended to help inform those who are seeking to adopt mobile learning technology systems with the aim of improving student throughput and success rate be it in conventional or distance learning institutions. The study defined mobile learning within the context of distance learning, but with the emphasis on the mobility of information communication technology devices that can be used to support or reach mobile learners anytime, anywhere. The study found that the use of mobile technology in distance education in South Africa has increased tremendously in the last few years. Technology-supported teaching and learning has helped enormously in overcoming the physical distance between educators and students, students and the institution, student and peers, enabling the flexible delivery of education at a distance, anyplace, anytime. This study pointed to the possibility of reaching a large number of students than through the traditional group discussions. It is clear that mobile communications play a great role in the ODL systems. The study also found that we have more students who own mobile phones than those who own personal computers. Furthermore, the study discovered that mobile technologies have influenced the delivery of instructional content and student support services and have transformed the management of distance education institutions. Mobile phone technology is widespread, easy-to-use, and is familiar to both learners and instructors and Unisa has the opportunity to be the leader in the provision of distance education through this mode of technology in the African continent.

Cell phone usage for learning has proved to be beneficial for both educators and students, not only as a cost-efficient method, but as an effective educational tool. The key to implementing successful student support services for distance learners in the twenty-first century is for faculty and staff to pragmatically and systematically re-define traditional student support services to ensure success for all learners. The study also revealed that distance education universities must commit financial resources to develop mobile technology for student support services. In conclusion, the researcher argued that since most of the students studying at ODL institutions have access to mobile phones, it is therefore important for the teaching staff to focus on the effective use of this technology.

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