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TECHNOLOGY VERSUS QUALITY EDUCATION IN AN UNDERDEVELOPED REGION: A CASE STUDY OF UNISA STUDENTS IN FORMER CISKEI HOMELAND IN EASTERN CAPE

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ABSTRACT

Aim/Purpose	This paper seeks to show how University of South Africa (UNISA) is using technology to connect lecturers, tutors and students of [UNISA] in an underdeveloped region in South Africa (SA) to reduce cost and time of travelling to access information, tutorials and help [available] in designated centers, hence making quality and higher education more accessible and less costly.
Background	This empirical study gives evidence to back the effectiveness, helpfulness and cost reduction of using technology as a medium of making quality and higher education accessible to under developed regions.
Methodology	Quantitative and purposeful sampling was deemed appropriate for the study, whereby 200 questionnaires was developed and specifically distributed to UNISA students from former Ciskei towns at East London Tutorial Center.
Contribution	The paper is about the usage of mobile technology for knowledge creation and dissemination, instruction and learning, The data generated and presented add to the knowledge base about underdeveloped countries. This data and the conclusions reached based the analysis could be of interest to researchers, university administrators, politicians, planners and policy makers in underdeveloped countries.
Findings	Evaluation of the overall effectiveness, helpfulness and cost reduction of

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e-tutorials show a slight advantage over the face-face tutorials.

Recommendations for Practitioners: In the quest for ways and means of making quality and higher education accessible to underdeveloped regions, no matter which medium is chosen, the periodic measurement of success in terms of effectiveness, helpfulness, and cost implication in relation to the learner cannot be over looked.

Recommendation for Researchers: More work needs to be done to check the effectiveness of technology as an efficient medium to provide access to quality and higher education to underdeveloped regional economies.

Impact on Society: The results could have significant implications for raising the level of education and advancing employment equity by improving the delivery and accessibility to quality and higher education to underdeveloped regional economies.

Future Research: The analysis of cost efficiency and effectiveness done in this work is just representative of one point of view: the student one of accessibility and cost. There is, however, need in future work to research the implications for the institutions of higher education (in terms teaching design, curriculum design, knowledge of individual learning types, need for change in and rate of change in knowledge view, learning philosophies), individual stakeholders, and the competitive repositioning of society.

Keywords: Higher education, technology, underdeveloped

INTRODUCTION

With the development of technology such as Internet, YouTube, Chartrooms, Skype not only supplemented traditional lessons by virtual ones [Arbaugh (2005), Beldarrain (2006)] but did increase the popularity of distance learning giving students a flexible schedule (anytime, anywhere learning) making it easy for students/people who can't afford being fulltime students on campus still have access to higher education and work at the same time. Zhu et al (2016) defined learning as a process of acquiring competence and understanding. This process therefore requires effective communication and collaboration between the locus of knowledge (in this case referring to lecturers, tutors) and the learner.

UNISA is the largest university on the Africa continent with over 300000 students across Africa and one of the leading universities in an open distance education. Open distance learning entails a student-centered approach that gives students flexibility and choice over what, when, where, and how they learn, and provides them with extensive student support. 2009, the year in which the Directorate of Students Admissions and Registrations of the University developed, and implemented a technology-driven registrations process, became the official year the University embrace[Infosheetenews26june08.pdf]and incorporated new technology to connect students to the University and also made the University more accessible as never before. This paved way for other new innovative ways based on technology to connect students, lecturers, tutors consequently changing the sphere of teaching and learning in terms of increase collaboration.

This collaborative process between students, lecturers and tutors working together to share knowledge creates community. Dron & Anderson (2007) define community as a group of

individuals who are engaged in a collaborative work. Engestrom (1987) emphasize the importance of interactions among the "players" in a community in his work as activity theory. Also with the emerging practices of institutions of higher education in an effort of delivering quality education and of learning that can be tailored to the unique needs of individual students, there is the need to consider a less costly complex holistic platform in which the students and the locus of knowledge come together and learners interact with networks of other learners. Technology facilitates dynamic multidirectional interaction between learners, instructors and the rest of the World [Cavazza (2008), Solis (2008)].

Researchers like Macedo-Rouet et al (2009) have highlighted the fact that most African countries are still struggling with unreliable electricity provision and an unstable internet systems. This has become more evident in South Africa. With the nation's current experience of load shedding raises questions about the use of and reliability of technology to facilitate interaction between learners, teachers and institutions of learning as well as an effective medium for delivering quality education.

In light of the above, it is necessary that this type of research studies is carried out to check the effectiveness and cost implication between face-to-face and e-tutorials currently been used by UNISA to support students in an under developed regions.

BACKGROUND

In the reign of former South Africa apartheid system, land was set aside for black people in self-governing territories. Ciskei and Transkei was designated as two homelands for Xhosa-Speaking people. Whittlesea, Alice, Balfour, Peddie, Dimbaza, KingWilliam'sTown, Zwelitsha, Mdantsane, Middledrift are some of the major towns that were in the former Ciskei homeland.

The region is underdeveloped in infrastructure and characterized by high levels of unemployment, poverty and crime which impact negatively on the economy. Access to quality and higher education is of great importance to the economic development of the region since education contributes positively to the fight against unemployment, poverty and promotes growth and development.

Quality education is one of the tools in empowering people and improving the standards of living in a society and the stability of a nation. As highlighted by Nussbaum (2011) (in Meyer 2014) education converts people's existing capacities into developed internal capabilities of many kinds. This formation is pivotal to the development and exercise of many other human capabilities which serves as a basic requirement of paramount importance in addressing disadvantage and functioning's central to dignity, equality, and opportunity.

PROBLEM STATEMENT

With open distance learning designed to be anytime, anywhere, the process requires effective support platforms where the learner can access information, materials, and can also provide interaction anywhere, anytime.

Developing such effective support platforms becomes an issue of effective use of human resources and integration of technology in the form of software that has functions to recognize and collect information, resources, materials, provide interaction and can run on hardware (eg., smart phones, laptops, etc) which can easily be accessible to the learner to engage the learner into effective, efficient and meaningful anytime, anywhere learning.

A great deal of research has been done on the vital role of interaction and collaboration in the sphere of teaching and learning. For instance, Bloom (1984) finds that an interactive form of in-class instruction (e.g., face-to-face tutoring) enhances learning. Johnson and Johnson (1986) show that collaborative learning helps students to retain information better than students working individually. Furthermore, Bandura (1977) & Vygotsky (1978) both constructivist theories conceive of learning as a social process that occurs through interactions, collaboration, and sharing information with each other.

With the revolution in communication technology and its introduction to the educational system, it became increasingly possible to incorporate principles of social interaction into the learning process. This made it possible for instructors and students to interact with each other in an informal setting which has a significant potential for supporting and enhancing teaching and learning through increased interactive information sharing, reflection, sense of community, and collaboration. Despite the potential of technology to support and enhance teaching and learning, very limited research has been done to estimate and evaluate the effectiveness and efficiency of technology as a medium to provide access to quality and higher education to underdeveloped regional economies at a reduced cost to learner and the higher education institution. Hence, this paper is a study to determine the effectiveness of technology as an efficient and cost reduction medium for providing access to quality and higher education in an underdeveloped region in South Africa. The results could have significant implications for delivering quality and higher education to underdeveloped regions in a large country.

RESEARCH OBJECTIVES

The primary objective of this study is to provide a better understanding of the effectiveness, general efficiency and cost effectiveness of technology in providing access to quality and higher education to underdeveloped regions in South Africa.

SIGNIFICANCE OF THE STUDY

This research has highlighted the need to consider technology as one of the tools used by educators and other stakeholders to provide access to quality and higher education to under developed regions in South Africa.

RESEARCH FRAME

It should be noted that this study is primarily aimed at eliciting the effectiveness, helpfulness, cost implication [efficiency] of face-to -face and e-tutorials used by UNISA to support open distance learning to students in an underdeveloped regions in South Africa. Quantitative research and survey sampling methods were deemed appropriate for this study. The use of sampling technique was based on the subjective judgment of the researcher. Following Welman & Kruger (2001) it was decided to only approach those persons who in his opinion are likely to have the required information and be willing to share it (Welman & Kruger 2001).Further ensure representativeness internal validity of the survey results participants were selected according to their area of residence targeting specifically those students residing in the six major towns in the former Ciskei homelands which were chosen for the study and are also doing a year course.

Figure1: Topographic map of former Ciskei Homelands.

Source: Wikimedia

A questionnaire was developed and the sampling instrument was printed and sent with an attached letter to East London Tutorial Center which serves mostly students from former Ciskei towns. The tutors at these centers were asked to specifically distribute the survey instrument to students from Alice, King William's Town, Peddie, Zwelitsha, Mdantsane, Middledrift who were enrolled in a year course (Figure 1). This was done on the last tutorial of 2015. Respondents were assured of confidentiality of their responses in the letter that was attached to the questionnaires informing them that their names would not be mentioned. This ensured that reliable information would be given. A total of 200 questionnaires were finally returned but only 189 were deemed usable because they were the ones who answered the questions fully. Descriptive statistics were used in the study (SEE APPENDIX).

DATA SOURCES

Every institution is established to achieve certain goals which are normally expressed in their mission statement. Adoption of certain programs of action by the institution is merely a solution that helps the institution to achieve the set goals. Thus the measurement of success of the adopted program or the medium against the set goals by means of research is of paramount importance. In expressing the institutional goals through UNISA mission statement [UNISA General Information and Rules 2010], the University promised to offer relevant learner support. Some of such support is the program of face-face tutorial support in designated centers across South Africa; and e-tutorials which can be downloaded and run on any mobile phone with internet access. The e-tutorial works the same as the like of WhatsApp, Facebook and any other social media. The face-face tutorial program is similar to a normal lecture classroom setting where students are required to go to lecture halls for tutors who are not lecturers to assist them with their tutorial works as well as explaining concepts, topics that they do not understand. Tutors are normally appointed per subject.

The tutorial support program of UNISA is designed in line with the South African higher education statutory and legislative framework as guided by the Constitution (1996)to extend over 15 (semester modules) and 30 (year subjects) weeks. In a study of 120 hours 10% is allocated to tutorials with additional three hours normally used for first or introductory tutorials and for the last tutorials which are usually used for examination preparation [TSDL 2008, SAIDE(1995, 1998)].

RESULTS AND IMPLICATIONS

The results of the current study provided some interesting information regarding the usage of face-to-face and the e-tutorials approaches to instruction. Table 1 shows the frequency of e-tutorial usage by the participant daily and weekly. The majority of respondents used the e-tutorial more than 2 times a day.

Table 1: Frequency of e-tutorial usage (N = 189)

Frequency of usage	Frequency	Percentage
Once a week	15	7.94
2-5 times a week	58	30.69
Once per day	47	24.87
More than 2 times a day	69	36.51

As can be seen, Table 2 presents the towns where the participants are residing, the frequency of attendance and the cost per one attendance of face-face tutorial.

Table 2: Frequency of attendance and cost per one attendance of face-face tutorial (N=189)

Town	Cost per one attendance (In Rands)	Number of student residing	Attendance Once	Attendance Twice	Attendance Thrice	More than four attendance
Alice	R90	20	5	10	2	3
King William's	R60	85	27	32	17	**9**
Peddie	R110	23	10	9	3	**1**
Zwelitsha	R70	17	2	8	1	**6**
Mdantsane	R20	34	14	16	2	**2**
Middledrift	R40	10	4	-	5	**1**

Table 3 shows 100% of participants have mobile phone with internet connectivity.

Table 3: Mobile phone with Internet data connectivity (N = 189)

	Frequency	Percentage
Yes	189	100
No	–	–

In terms of "weekly data bundles usage", this study reveals that more than half of the participants (n= 105) used about 50MB per week (Table 4).

Table 4: Weekly data bundles usage and cost.

Weekly data bundles	Number of students	Cost (In Rands)
50MB	105	R10
100MB	78	R15
150MB	6	R35

From the results (Table 5), it can also be concluded the participants are able to access mobile phone internet either on the excellent level (n=107) or at good level (n= 82).

Table 5: Ability to use Internet on the mobile phone (N =189)

	Frequency	Percentage
Excellent	107	56.61
Good	82	43.39
Average	–	–
Poor	–	–

In terms of connectivity, majority of participants reported the excellent level (n=139), however about 4 of them expressed the average connectivity in their area (Table 6).

Table 6: Internet connectivity in their area (N = 189)

	Frequency	Percentage
Excellent	139	73.54
Good	46	24.34
Average	4	2.12
Poor	–	–

The participants were also asked about the effectiveness and helpfulness face-to-face and the e-tutorials approaches to the usage and connectivity instruction. As it can be seen in Table 7, more than half of the participants (n= 99) found the e-tutorial approach more effective and helpful than Face-to-Face approaches.

Table 7: Effectiveness and helpfulness (N=189)

	Yes	%	No	%
Face-face	91	48.15	98	51.85
e-tutorials	99	52.38	90	47.62

Finally, the demographic profile of participants were asked and reported in Table 8. Majority of respondents fall between age of 29 -39 years old (n=133) and in terms of gender more than half of the participants are female (n=108).

Table 8: Demographic profile of the participants

	Frequency	Percentage
Age		
20 – 39	133	70.37
40 – 59	56	29.63
Gender		
Male	81	42.86
Female	108	57.14

HYPOTHESIS

The main objective of this study is to measure the difference in Face-to-Face and e-tutorials preferences among the participants and therefore the following hypothesis has been derive:

H_o: There is no preference shown for Face to face over e-tutorials or vice versa.

Referring to Table 7 shows that the majority of participants found the e-tutorial approaches more effective and helpful than the Face-to-Face approaches. However, when it comes to the preference of interaction, it seems both ways of approaching are preferred and accepted by the respondents (p =0.876062 and null hypothesis cannot be rejected). From the finding, it can be concluded the evaluation of the overall effectiveness and helpfulness of e-tutorials show a slight advantage over the face-face tutorials as seen in Table 7. Also the findings of this study show; considering cost implication without looking at distance, safety, the tiredness and time involve of a student residing at Alice and deciding to attend two face-face tutorials. The cost involve will be 2 x R90 = R180 but if the same student decides to use e-tutorial to communicate with the tutor twice a week and uses 100MB of data will not cost more than R20.

CONCLUSION AND FUTURE WORK

This study has confirmed the results of the study of Cornford & Pollock (2003), "Putting the university online: Information, technology and organizational change", helps to remove the need to travel in order to join together to learn and study, thereby resulting in significant cost reduction. The analysis of cost done in this work is student-centered and relates to cost reduction to the learner. There is, however, need to study/explore the institutional side of the equation as a future work.

In the quest for ways and means of making quality and higher education accessible to underdeveloped regions, no matter which medium is chosen, the periodic measurement of success in terms of effectiveness, helpfulness, and the cost implications for the learner cannot be overlooked. Clearly, from the results of this study, technology is one of the medium/factors to be considered.

LIMITATIONS OF THE STUDY

The study only focused on UNISA students of the former Ciskei homeland in the Eastern Cape, thus making it a regional-specific study. UNISA students from other former homelands of South Africa, which were outside the targeted geographical area, were excluded due to time and financial constraints. The study lack external validity in the sense that it cannot be generalized to South Africa as a whole or for that matter to UNISA students as a statistical population.

REFERENCES

Arbaugh, J. B. (2005). Is there an optimal design for on-line MBA courses? *Academy of Management Learning and Education*, 4(2), 125-149.

Bandura, A. (1977). Social learning theory. Englewood Cliffs, N.J: Prentice-Hall.

Beldarrain, Y. (2006). Distance education trends: Integrating new technologies to foster student interaction and collaboration. *Distance Education,* 21(2), 139-153.

Bloom, B.S. (1984). The 2-sigma problem: The search for methods of group instruction as effective as one-to-one tutoring. *Educational Researcher*, 13, 4-16.

Cavazza, F. (2008). Social media landscape. Available at: http://www.fredcavazza.net/2008/06/09/social-media-landscape/ [Accessed: 15th July 2015]

Cornford, J., & Pollock, N. (2003). Putting the university online: Information, technology and organizational change, Philadelphia: Open University Press.

Dron, J., & Anderson, T. (2007). Collectives, networks and groups in social software for e-learning.Paper presented at the Proceedings of World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education, Quebec. Available at: http://www.editlib.org/index.cfm/files/paper_26726.pdf. [Accessed: 11th July 2015]

Infosheetenews26june08.pdf. Available at: http://www.unisa.ac.za/contents/faculties/theology/docs/info_sheet_enews_26june_08.pdf [Accessed: 13th May 2015]

Johnson , R. T., & Johnson, D. W. (1986). Action research: Cooperative learning in the science classroom. *Science and Children,* 24, 31-32.

Macedo-Rouet, M., M. Ney & S. Charles. (2009). Students' performance and satisfaction with Web vs. paper-based practice quizzes and lecture notes. *Computers and Education*, 53:375–384.

Meyer, M. F. (2014). The relationship between quality of life, education, and poverty and inequality in South Africa: The capability approach as an alternative analytical framework. MThd dissertation. Cape Town: University of Western Cape.

Ngengebule, A.T (1998). Tutor Handbook. UNISA.

Nussbaum, M. (2011). Creating capabilities: The human development approach. Cambridge, Massachusetts: The Belknap Press of Harvard University Press.

Solis, B. (2008). Introducing the conversation prism. Available at: http://www.briansolis.com/2008/08/introducing-conversationprism.html [Accessed: 13th May 2015]

SAIDE (South African Institute for Distance Education) (1998). A Tutor's guide.

SAIDE (1995). Open learning and distance education in South Africa. Report of an international commissions, January - April, 1994.

TSDL (2008): Tutor handbook. Available: http://www.unisa.ac.za/contents/courses/docs/TSDL%20Tutor%20%20Handbook.pdf [Accessed: 20th February 2014]

UNISA General information and rules (2010). Available at: http://www.unisa.ac.za/contents/courses/calendars/2010/pdf7/7_2010_e.pdf [Accessed: 4th April 2015]

Vygotsky, L. (1978). Interaction between learning and development. From: Mind Society pp. 79-91. Cambridge, MA: Harvard University Press.

Welman, J. C. & Kruger, S. J. (2001). Research methodology, 2nd Ed. Oxford University, Cape Town.

Zhi-Ting, Z., Ming-Hua, Y., & Riezebos, P. (2016). A research framework of smart education. Smart Learning Environments 3(1). Available at: https://slejournal.springeropen.com/articles/10.1186/s40561-016-0026-2 [Accessed: 28th January 2017]

APPENDIX

Survey Measurement Instrument on the effectiveness, helpfulness, and cost implications of face-face versus e-tutorials Instructions.

Student questionnaire.

1) Please indicate your age?

   …….

2) Please indicate your gender?

Male	Female

3) How many times have you attended the face-to-face tutorial for this module you are about to write?

Once	Twice	Thrice	More than four

4) Do you have mobile phone with internet data connectivity?

Yes	No

5) Generally how do you rate your ability to use the internet on your mobile phone?

Excellent	Good	Average	Poor

6) Describe the internet connectivity when using internet on your mobile phone in your area?

Excellent	Good	Average	Poor

7) How often do you use the platform of e-tutorial to communicate with your tutor concerning this module you are about to write?

Once a week	2-5 times a week	Once per day	More than 2 times a day

8) Which town are you residing?

Alice	KingWilliams	Peddie	Zwelitsha	Mdantsane	Middledrift

9) How much does it cost you to attend one face-to-face tutorial at this center?

……..

10) Approximately how many data bundles do you use in a week when using e-tutorial together with other social media and how much does it cost you?

50MB	100MB	150MB	More than 150MB

11) In your opinion, which one of the two face-to-face and e-tutorials is more effective, helpful to you?

……..

BIOGRAPHY

Agyei Fosu is a lecturer in the Department of Information Technology at the Walter Sisulu University where he teaches Information Technology Skills as well as mathematics for IT. He is actively involved in technology in education research.