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To Investigate the Effects of E-Learning on the Academic Performance of Distance Students: A Case Study of the University of Zambia.

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ABSTRACT

This report seeks to evaluate teachers' experiences and perceptions on the introduction of ICTs in secondary The main objective of this research was to investigate the effects of e-learning on the academic performance of distance students. The study was based on the following research questions; to determine the effect of e-learning on students' performance in Statistics and to determine the challenges involved in the implementation of e-learning in teaching statistics at the University of Zambia. The study used a descriptive survey research design to find characteristics of the research study and the target population for this research was third-year students from the Institute of Distance Education at the University of Zambia. Simple random sampling was used to select a sample of students from the target population.

The sample size was 57 participants. The study had 57 questionnaires which were distributed for analysis based on the respondent's feedback. This analysis used descriptive methods such as frequency, percentages, and tables to analyse data. The study found that 25 (43%) had never been trained on how to use the portal on the e-learning platform and 32 (61%) have been trained. Participants were also asked if they agree or disagree that e-learning is effective on the academic performance of distance students and the study established that 7 (12%) strongly agreed, 9 (16%) agreed, 25 (44%) disagreed that e-learning is not effective on the academic performance of distance students and 16 (28%) they strongly disagreed as well.

Furthermore, participants were asked how they rate the system performance during the submission of assignments on the portal and the study revealed that 19 (33%) said very effective, 23 (40%) said moderately effective, and 10 (18%) said least effective and 5 (9%) said not effective at all. Participants were asked how often they encounter challenges in loading content on the e-learning platform and the study discovered that 8 (14%) said never, 12 (21%) said less often, 14 (25%) said often and 23 (40%) said very often. Participants were also asked about the challenges that are involved in the implementation of e-learning in teaching at the University of Zambia and the study established that 21 (37%) said limited bundles, 5 (8.8%) said limited feedback from lecturers, 8 (14%) said limited access to website and 23 (40%) said no training is been offered to students.

Keywords: Performance, Students, E-Learning, University of Zambia and Questionnaires

Introduction

The rapid development of information, communication, and technologies (ICT), internet technologies, and Web-based applications have initiated an unparalleled transformation in universities all over the world (Cheng 2010). Electronic learning (e-learning) is changing the way teaching and learning are taking place on university campuses (Ahmed, 2010). Though the upscale of e-learning in developing countries especially in Africa is slow compared to their Western counterparts, the last decade has witnessed some concerted efforts on the part of university administrators to implement e-learning strategies to catch up with their counterparts in developed countries.

Essentially, e-learning is usually defined as a type of learning supported by information and communication technology (ICT) via the internet, intranets, extranets, or many others to improve the quality of teaching and learning. A broader definition of e-learning is provided by Selim (2007:397) as "the delivery of course content via electronic media, such as internet, intranet, extranets, satellite broadcast, audio/video tape, interactive TV, and CD-ROM. E-learning is divided into different types ranging from web-supplemented courses, through web dependent to mixed mode courses, and finally fully online courses (OECD, 2005).

E-learning refers to the use of new technologies in the service of learning and/ or learner support (Laurillard, 2006). It includes the delivery of content via the Internet, intranet, audio-, and videotape; satellite broadcast, interactive TV, and CD-ROM (Boon et al, 2005). E-learning technologies can be used in three main ways in universities and colleges: technology-enhanced classroom teaching; distance education (in a bid to reach more students who cannot gain access to conventional universities); and distributed learning (a mix of deliberately reduced face-to-face teaching and online learning also called 'the mixed mode' or ' flexible learning). E-learning can help to encourage learner-centeredness. Web et al (2004) cite Kolb's model which involved an

approach similar to action research. The approach is geared towards four elements: active experimentation, concrete experience, reflective observation, and abstract conceptualization.

E-learning strategies require a realization of the changes in both the demand for and supply of e-resources. Developing an e-learning strategy is essential in setting a course that will enable a university, faculty, or department to achieve predetermined goals (Engelbrecht, 2003). It should be about providing a solution; a return on expectation; enabling learning and driving performance; motivating learners and encouraging organisations; and ensuring that it becomes interwoven into the fabric of the entire institution (Dublin, 2004). The models developed for these strategies undergo a five-phase process: initial stage, planned stage, defined stage, managed stage and optimizing stage (Marshall, 2004).

According to case studies, there are already several e-learning programs offered in developing countries (Kohn et al. 2008). These programs are developed by various national and international initiatives, for example, the group learning sets initiated by Computer Aid International in collaboration with the University of Zambia. The growth of e-learning programs is driven by the need for and potential of providing education in less expensive ways, increased access to information, effective learning, and greater flexibility.

Stephenson (200) posits that there is little systematic research into the overall effectiveness of e-learning as a learning medium despite the great interest in it. He acknowledges that while there is much more work to be done, a variety of e-learning courses aimed at making sustainable development a reality has been developed and demonstrate how e-learning can reach thousands if not millions of minds and potentially plant the seeds of change.

1.1 Literature Review

Communications and information technology has changed our life in one way or another. With the development of information and communications technology, the term E-learning, which is the acquisition, use, distribution, and facilitation of knowledge in the first place by electronic means, has emerged. This type of learning depends on the Internet and computers. (Tossy, 2017).

The adoption of E-learning in education, especially in the higher education institutions, has many benefits when it comes to its flexibility with time and space for the learners and institutions at the time of conducting meetings. This gives a greater chance to access enormous amount of information with less time and effort. E-learning is also a cost-effective method as the students do not need to travel and move every day, at the same time, the higher education institutions are less required to offer huge buildings and a large number of faculty members to keep on the progress of the educational process (Arkorful and Abaidoo, 2014).

Electronic learning or e-learning is used to offer instructional programs to distant learners (Arkorful and Abaidoo, 2015). It is an online learning platform that emerges in a formal context and utilizes a variety of multimedia technologies. Electronic hardware and software support this system either offline or online. A personal computer is usually used for delivering training or computer-enhanced learning related to e-learning (Samsuri, Nadzri and Rom, 2014). Other communication technologies deliver learning based on tutorials, learning support systems, and online lectures (Kattoua, Al-Lozi and Alrowwad, 2016). It is based on technology for improving classroom engagement through positive environment, where students are deliberately engaged in online tutorials for completing a task assigned to them.

E-learning ensures that students are completely involved as learning takes place together with texts, videos, sounds, collaborative sharing, and interactive graphics. It may enhance the quality of teaching and learning; report the need for higher institutions for maintaining competitive advantage, and access to education and training in this globalizing marketplace for students (Islam, Beer and Slack, 2015). The integration of information technology (IT) in the form of e-learning has resulted in the reduction of students cost while improving the quality of learning and teaching (Songkram, 2015). This shows that e-learning can be economical for students using it, and they can perform other useful activities in their spare time (Aparicio, Bacao and Oliveira, 2016).

On the other hand, E-learning may cause a decrease in the institutions and teachers' roles; also, it may affect the values, the educational process and the social life of students negatively. In addition, unacceptable disciplinary actions of the students such as cheating could be hardly controlled, and the educational system is also likely to be not protected and may be a victim to piracy or plagiarism. Moreover, by using E-learning methods, it is not possible to study some scientific fields which require physical presence, for instance conducting experiments in laboratories or doing close training (Arkorful and Abaidoo, 2014).

Results in e-learning are better than Conventional Learning Approach. Cooperative e-learning teaching strategy enhance students' learning in Biology leading to improved achievement compared to conventional methods (Orora et al., 2014), The key in Cooperative e-learning is working together and the group has a clear task or goal so that everyone knows they sink or swim together. The efforts of each person benefit not only the individual, but also everyone else in the group. There is positive interdependence once Cooperative e-Learning is applied as a teaching strategy. Positive interdependence is important for students because students are committed to the work as they want personal success as well as the success of every member of the group.

The use of e-learning is effective for students for construction of knowledge and creativity acquisitions (Zare et al., 2016). Creativity is important for students as topics are covered online. E-learning helps students to be creative and to work hard. For example, when using Moodle software, if an assignment is set for two weeks, students should submit the assignment using Moodle within two weeks and those who delays end up failing the assignment as the system cannot allow them to submit. Despite the positive effect of e-learning on academic performance of learners, there are also challenges associated with this teaching strategy.

E-learning raises significant challenges to learners on technical part (Rana et al., 2014). Technical challenges may include internet failure or internet does not work according to what academics require. Success in the implementation of E-learning educational system as one of the main approaches in managing knowledge and educational needs of higher education organization will not be achieved without identifying the different skill, technical and cultural challenges (Leila et al., 2018). Cultural challenges should be identified before implementing e-learning because everyone has got their ways of learning based on their culture. For example, those who are used with taught way of learning will have challenges to adapt to E-Learning strategy and their academic performance will be affected negatively.

According to Ministry of Education (2013), learner-centered approach or pedagogy approach of learning should be applied in classes when teaching. This involves learners to learn Mathematics in context of multipart, comprehensive and practical problems. Under such learning situations learners may be required to identify what they already know, what they need to know and how and where to access new information that may lead to resolution of the problem. These are some of the challenges faced when using e-learning strategy.

The implementation of e-learning in education has been favourable in multiple contexts. Previous studies, have presented several advantages associated by the implementation of e-learning technologies into university education (Raspopovic et al., 2017). E-learning has been viewed as the ability to focus on the requirements of individual learners. For instance, focusing on the needs of individual learners can deliver knowledge in digital age effectively as compared to educational institutions' needs or instructors (Huang and Chiu, 2015). Objectives can be achieved in the shortest time with least efforts through e-learning. When managing the e-learning environment, its effect on educational learning are observed in providing equal access to the information regardless of the users' locations, their ethnic origins, races, and ages. The environment for e-learning also help students or learners to rely on themselves so that instructors are no longer the solitary knowledge source rather they serve as guides and advisors (Joshua et al., 2016).

Despite of the significant advantages of e-learning, students encounter several challenges which ultimately lead towards either limited or negative outcomes. Such as; Arkorful and Abaidoo (2015) in their study outlined that e-learning, in certain cases is held through remoteness and contemplation resulting in lack of student's interaction. In comparison with the contemporary mode of education, e-learning might result in being less effective due to the absence of face to face encounter with instructions or teachers. Since in e-learning method, assessments are generally held online which reduces the possibility of restricting illegitimate activities such as; cheating, plagiarism etc (Arkorful and Abaidoo, 2015).

The absence of essential personal interactions is the most noticeable drawback of e-learning, not only among colleague learners, but also between instructors and learners (Islam, Beer and Slack, 2015). There is a scarcity of community in the online learning environment as student-student engagement is much less of a concern when compared with student-instructor interaction. Gilbert (2015) highlighted that most of the students wish to work autonomously to avoid the need to interact with their classmates. Cultural barrier is another important disadvantage of introducing an online course. Aparicio, Bacao and Oliveira, (2016) in their study evaluated the influence of cultural characteristics which includes individualism and collectivism in determining the perceived success of e-learning. Findings of the study indicated a significant influence of individualism and collectivism on organizational and individual impacts.

Technology is a platform that can be easily acquired for granted when it is engaged into daily life, but it is not widely used because of the lack of monetary benefits for achieving access. The global knowledge available on the internet is led by increasing the proportion of computers and other electronic devices to students (Talebian, Mohammadi and Rezvanfar, 2014). Another disadvantage is maintaining motivation in an online course that online learners experience. Students who lack self-motivation and independence had reduced success rates as compared to their counterparts (Sarkar, 2012). Learners that lack self-regulation have a tendency to not assign sufficient time for completing assignments; therefore, switching in poor quality work or late assignments. Overall, successful students have stronger beliefs that they will succeed better technology skills and access, higher self-responsibility, and higher self-organization skills (Sarrab, Al-Shihi and Rehman, 2013).

Education is a key factor for sustainable development (Chimombo 2005). The significance of education, especially in developing countries, is increasing because of progressing pressure to catch up with the developed world regarding, for example, global competitiveness (Hawkins 2002). Predictably, educational settings are different in developing countries than in developed countries, such as low quality of education and narrow possibilities in attending schools in rural areas because of far distances and high opportunity costs (Ibid 2005). Chimombo, 2005 opines that country-specific circumstances have to be improved regarding compulsory and free education to foster general access to education. In Article 26 of the 1948 UN universal declaration of human rights the right of obligatory and free education for everyone is already committed (UN Human Rights 1948).

Every year, more of the world's people become connected to the network, its bandwidth increases and its use becomes more integrated to all that happens in the globe. Connectivity to this network has becomes key to opportunity, success and fulfillment for individuals. Kenya has defined a national ICT policy with a view of creating an e-enabled and knowledge-based society by the year 2015. Just like the technology has changed the world, it is now changing the learning and teaching environment.

A broad range of learning approaches exists already, for example, e-learning, blended learning (Maier, 2007), and distance learning which utilize information and communication technology (ICT). The use of ICT can benefit, for example, students in rural areas by having them attend classes as distance learners and motivating them to learn like the "Group Learning Sets" (GLS) initiative offers. Regarding this, the potential of e-learning seems very assuring, but because of gaps between developed and developing countries knowledge transfer is not only difficult but also costly.

E-learning denotes the use of ICT by teachers and learners. Schmidt 2005 holds that e-learning consists of conventional training, such as courses, ad-hoc training, selected learning objects, formalization through document collections and community formation which can be achieved via social software. According to case studies, there are already a number of e-learning programs offered in developing countries (Kohn et al. 2008). These programs are

developed by various national and international initiatives, for example, the group learning sets initiated by Computer Aid International in collaboration with Kenyatta University. The growth of e-learning programs according to Lockwood and Gooley, 2002 is driven by the need for and potential of providing education in less expensive ways, increased access to information, effective learning and greater flexibility.

Stephenson, 2001 posits that there is little systematic research into the overall effectiveness of e-learning as a learning medium despite the great interest in it. He acknowledges that while there is much more work to be done, a variety of e-learning courses aimed at making sustainable development a reality have been developed and demonstrate how e-learning can reach thousands if not millions of minds and potentially plant the seeds of change.

Tavangarian et al., (2004) observed that E-learning is the adoption of electronic media to facilitate teaching and learning. It utilizes technology to deliver information embedded in educational material to learners situated in diverse geographical areas. E-learning is a substitute method for teaching and learning. It veers away from the conventional classroom lectures (Herrington et al., 2010). Alavi & Leidner (2001) conceptualized E-learning as a virtual learning environment where different forms of information technologies are used to mediate between the learner and the instructor. E-learning attempts to shift the focus of educational environment away from the physical teacher-student environment while disseminating information. Without regards to distance, instructors utilize new and improved web -based technologies to plan and structure teaching materials (Clark & Mayer, 2008).

According to these authors, e-Learners are subjected to more critical challenges when compared to conventional learners. This is so because the efforts which should have been put in by instructors in motivating and instilling discipline in learners are transferred to the e-learner in an e- learning setting. Stated succinctly, the responsibility of inspiring and encouraging discipline is transferred from the conventional lecture- bearing instructor to the learner himself (Liaw, 2008). E- Students are themselves managers and students. They actively manage their learning process while the instructor sets the guidelines (Downes, 2005). E- Students see this as a barrier and it frustrates their learning efforts. The frustration either leads to high drop-out rate or reduced learner satisfaction (Liu et al., 2006).

Several studies have shown the positive effects of e-learning from the insights of learners or students (Gautam and Tiwari, 2016; Martínez-Caro, Cegarra-Navarro and Cepeda-Carrión, 2015; Chang, 2016). For instance; e-learning allows to observe much flexible learning ways to go for classes with much reduced need for travel. Learners are allowed to get deeper insights of the information through activities that are carried-out in the classroom through interactive video facility (Gautam and Tiwari, 2016; Martínez-Caro, Cegarra-Navarro and Cepeda-Carrión, 2015). This allows learners to respond promptly toward the activities.

It is important for instructors to embrace the advanced technology throughout the process of teaching and; therefore, learning has a range of skills in information and communication technology (ICT) (Aithal and Aithal, 2016). It is also observed that e-learning systems allow enhanced communication between students, and instructors. Part time and full-time students can actively participate in the online degree courses selected from any location or place, providing people who are traveling or relocated an easily accessible resource for experience and learning (Radu, Radu and Croitoru, 2015).

The integration and use of e-learning offers disabled people an opportunity for advancing their education from any location. Four common types of e-learning systems have been developed which includes; Learning Content Management System (LCMS), Learning Support System (LSS), Learning Design System (LDS), and Learning Management System (LMS) (Adzharuddin and Ling, 2013). Although all the system has a similar name, however, the function of each system is different. In the process of e-learning, LMS has been widely used by various education institutions. It is further regarded as a platform that is used to manage user's experience while interacting with e-learning content. LMS in general perform three common functions, which include; presenting and systematizing training content, create assignments to test and solidify knowledge, to evaluate progress (Rietsema, 2016).

The LMS software is further used to publish, plan, deliver, and place self-placed online courses. Muruthy & Yamin (2017) in their study examined how LMS is effective for students enrolled in higher education institutions, along with their usage in the learning process. A number of advantages were outlined in this study. First include flexibility, as the use of LMS resulted in increased collaboration between faculty and students. It is further effective in enhancing the institutional practices which requires learner's involvement. LMS is also effective in promoting centralized learning, easy upgrades, simplified learning process, low cost, centralized learning etc (Muruthy & Yamin, 2017).

2. Material and method

The research design refers to a plan and technique incorporating stages of comprehensive expectations to detailed methods of how data was collected, analysed, and interpreted (Chetty, 2019). This study approach selected quantitative in that it was able to quantify the study on hand via the generation of numerical data, converted into statistics. The quantitative research method operates with statistics and anything quantifiable in an organized way of investigating occurrences and relationships. This approach also was it easy for this researcher to apply statistics in the analysis of the problems. The approach encompassed the explanations, forecasts, and regulation of occurrences.

A plan of how and where data was collected and analysed. To assess water supply and sanitation services by Lusaka water and sewerage, a descriptive research design will be employed. Hale (2018) defines descriptive research design as explaining the characteristics of a sample taken from the population and generalizing their conclusions to represent the entire population. The study used a survey method of descriptive research design as participants were meant to provide answers from questionnaires.

The sample size is a collection of items from the population or a subset of a group of interest that is studied in research (Macnee & McCabe, 2008). To select the number of students to be part of the study, the researcher established the total number of distance students who are in third year to be 210. Therefore, the following formula by Cochran, (1963) was used to come up with the sample size for students.

The formula: $n = \dfrac{N}{1 + N(e)^2}$

Whereas: N= Target population

n=Total sample size

e = Desired margin error

N=210 desired margin error (0.05)

n = 210/1+210(0.05) 2 = 80 students

In the study, out of the 80 participants as the population size, 57 participants were sampled using the formula above; this is because there were limited resources and time for the researcher to collect data from a sample size bigger than the one used.

The sampling technique is that part of the study that indicates how respondents were selected to be part of the sample and were not selected haphazardly but chosen systematically. Purposive sampling was used in the study to select the worker from the bank. Households were then sampled randomly and purposively. This means that the study targeted a group of households believed to be reliable for the study. If the chosen house failed to give a response, the next house was included. This technic can be carried out in addition to probability sampling and is particularly relevant when a study is concerned with exploring the universe and understanding the audience. Purposive sampling can be used with both quantitative and qualitative studies (Kombo and Tromp, 2006).

A reliable data collection instrument is a questionnaire. It is used when collecting data over a large sample. The questionnaires will be administered to distance students at The University of Zambia. The administering of the questionnaires to respondents was arrived at after creating an understanding between the researcher and the respondents, by explaining the purpose of the study. Also, the availability of many respondents at a time made it possible for the researcher to collect data within a short period, get a high response rate and also reduce financial expenses.

3. Results and Discussion

The study was aimed at investigating the effects of e-learning on the academic performance of distance students. The findings were summarized as stated below: The study revealed that 32 (56%) were female students compared to male students 25 (44%) took part in the study. The study discovered that 35–44 years constitute (35.1%). Those who were above 45 years were 24 (42.1%) and those that were 18-24 years were 4 constituting (7.0%) and 25-34 years were 9 (15.8%) respectively.

Out of the total number of 57 respondents sampled, the study established that 17 respondents representing 30% were not married, 23 respondents representing 40% were married, 7 respondents representing 12% were divorced, 9 respondents representing 12% were widows and 1 of the respondents representing 2% were widowers.

5.2 Effect of e-learning on students' performance in Statistics

Participants were asked if they have received any formal training on how to use the portal on the e-learning platform and the study revealed that 25 (43%) said no meaning they have never been trained on how to use the portal on the e-learning platform and 32 (61%) said yes meaning they have been trained. The University of Zambia is using Moodle and some students were not taught how to use Moodle the training for lectures came after the program started. The findings of the study are in line with the findings of (Islam et al., 2015) who concluded that there are technical training challenges when using e-learning. Before students use the e-learning approach, students should be trained on how to learn using the e-learning strategy. For example, students should be trained on how to use Moodle to download the lessons and videos. Lecturers should also be trained on how to handle e-learning strategy for it to be a successful learning strategy. There is a lack of motivation on the part of students when e-learning is applied as a learning strategy. Some students have paid school fees but they are not registered in the system and it is difficult for them to access e-learning and students are demotivated to learn.

Participants were also asked if they agree or disagree that e-learning is effective on the academic performance of distance students and the study established that 7 (12%) strongly agreed, 9 (16%) agreed, 25 (44%) disagreed that e-learning is not effective on the academic performance of distance students and 16 (28%) they strongly disagreed as well. The study has shown that the e-learning strategy has the potential to improve students' academic performance in statistics. The learning approach has a positive effect on the student's academic performance in statistics. The results would imply that incorporating e-learning would enhance the learning of students.

Furthermore, participants were asked how they rate the system performance during the submission of assignments on the portal and the study revealed that 19 (33%) said very effective, 23 (40%) said moderately effective, and 10 (18%) said least effective and 5 (9%) said not effective at all. This is in line with the results of (Oye et al., 2012) who concluded that the use of e-learning improves students' performance as compared to face-to-face teaching. The improved performance of the students after using the e-learning approach is a result of students being in charge of their learning and there is more learner-centered learning.

5.3 Challenges involved in the implementation of e-learning in teaching at University of Zambia

Participants were asked if they have any challenges in terms of loading content on the e-learning platform (Astria Learning) and the study revealed that 24 (42%) said no meaning they have no challenges in terms of loading content on the e-learning platform (Astria Learning) and 33 (58%) said yes meaning they have challenges. Despite the positive effect of e-learning on the academic performance of students, the learning approach has challenges for students and lecturers. E-learning raises significant challenges to learners on the technical part. Technical challenges in this study are internet failure or the internet does not work accordingly. The findings of the study are consistent with the findings of (Rana et al., 2014).

Participants were asked how often they encounter challenges in loading content on the e-learning platform and the study discovered that 8 (14%) said never, 12 (21%) said less often, 14 (25%) said often and 23 (40%) said very often. Participants were asked about the challenges that are involved in the implementation of e-learning in teaching at the University of Zambia and the study established that 21 (37%) said limited bundles, 5 (8.8%) said limited feedback from lecturers, 8 (14%) said limited access to website and 23   (40%) said no training is been offered to students.

All students and lecturers who participated in the study claimed that buying bundles to be used in e-learning is expensive. Before using e-learning, different skill, technical and cultural challenges should be identified. The results from the study are in line with the findings of (Leila et al., 2018) who concluded that for E-learning to be a success in the implementation of the educational system, different skills; technical and cultural challenges should be identified. Cultural challenges should be identified before implementing E-Learning because everyone has got their ways of learning based on their culture. For example, those who are used to teaching the way of learning will have challenges adapting to the e-learning strategy and their academic performance will be affected negatively. Not all the students have smartphones and lecturers are required to buy laptops and this is a challenge for both students and lecturers. For e-learning to be effectively used, it is important to understand students' learning styles.

The results from the study show that e-learning offers a tremendous opportunity by the means of electronic and students can learn at their own pace and the results can be better than the traditional method of teaching. Findings from this study are similar to the findings of (Manya et al., 2018) who concluded that traditional learning is expensive and takes a long time, and the results can vary. One key aspect of e-learning is that it offers an alternative that is faster, cheaper, and potentially better than the traditional way of teaching.

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