

Assessing the Utilization Level of E-Learning Resources among ODL Based Pre-Service Teacher Trainees

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Abstract: Electronic resources have become a dominant feature of higher education, both traditional and distance learning based. Unlike in the past when universities relied majorly on the physical library and hard copy of books, e-books accessible through e-libraries are the dominant features of this century's institutions of higher learning. This study investigated pre-service teacher trainees by distance and the utilization of e-learning resources. A survey research design was used to carry out the study. One hundred and forty four (144) pre-service teachers by distance from three institutions offering teacher training programmes by distance in South Africa completed the anonymous web based survey designed to gather data which provide answers to the five (5) research questions in the study. The results revealed a high utilization of e-resources to learn but a low utilization of e-resources to teach among the respondents. The study recommends institutional based training on the techniques of accessing and utilizing e-learning resources for pre-service teacher trainees in ODL institutions.

Keywords: E-Resources, e-learning, open and distance education, pre-service teachers.

1. Introduction

The use of open and distance education for teacher training is increasing in Africa and electronic resources are widely used by many ODL based institutions on the continent, both to teach and receive feedback from learners. A range of studies (Tait, 2000, Shin 2003, Selim, 2007, Sun et al 2008, Olaniran, Duma and Nzima 2016) that investigate what makes open and distance education effective have identified common features that accounts for effectiveness of open and distance learning programmes. These studies have reached similar conclusions. Some of the main features they highlighted include:

- Flexibility of e-learning course and technology, e.g. is there any technical knowledge or skill required in accessing or using them
- Quality and relevance of the available electronic resources to learners, e.g. are the e-resources have significant effect on their learning
- Perceived usefulness and ease of use, e.g. how useful are these e-resources and are they easy or difficult to use
- Affordability of the resources by the learners, e.g. will learners buy, subscribe or use free of charge
- Level of availability of support staff/facilitator to provide timely feedback to learners, e.g. are there help desk or support staff available in case learners encounter any difficulty while accessing or trying to utilize the e-resources.

Going by the aforementioned features, one can conclude that the level of success of any distance learning programme depends largely on the commitment of institutions in ensuring enabling environment for their learners in accessing and utilizing e-resources for teaching and learning engagement. Moreover, one of the key features of effective teaching today lies in the ability of teachers to make use of electronic instructional materials that meet the needs of students and prepare them for this ICT driven 21st century (National Research Council, 1997). The thrust of this study is to investigate the level of utilization of e-learning resources among those studying to become classroom teachers by distance in South Africa. The major objectives of this study are:

1. To inquire about the rate at which pre-service teachers are accessing e-resources
2. To investigate the most accessed electronic resources by the pre-service teachers
3. To find out the types of device through which the electronic resources are being accessed
4. To investigate how the e-learning resources accessed are being utilized in the classroom

5. To find out the challenges facing pre-service teacher trainees in accessing and utilizing electronic resources.

2. Literature Review

2.1 Teacher Training By Distance in South Africa

South Africa is one of the countries in Africa that is using open and distance mode of learning to train teachers, at both initial and professional development levels. A report by the Mathematics, Science and Technology Ministerial Task Team, drafted in 2013, found that the country had a serious lack of qualified, skilled and experienced teachers in all levels of education, especially in key subjects like mathematics, sciences and technology. Studies (Pityana 2007, Biao 2012 and Samkange 2013) have revealed that conventional institutions have their limitations and cannot adequately cater for the huge number of teachers needed to meet the 21st century educational needs of both developed and developing nations of the world. Because of the limitations of space and location that comes with traditional education system, open and distance learning, therefore, becomes an alternative to train new sets of teaching personnel and also to give professional development training to the in-service teachers. Similarly, open and distance education could be described as an educational process in which a significant proportion of learning takes place remotely and flexibly beyond the formal learning environment (Aderionye and Ojokheta 2004, and Alkali 2015). It comprises organized educational activities in which constraints on learning are minimized in terms of access, time and place as well as pace and method of study.

In South Africa, the Department of Higher Education and Training supports learning by distance for those who cannot or who chooses not to attend traditional campus-based institutions (DHET 2014). The operation and delivery of Open and Distance Education in South African Institutions is hinged on the belief of access which was one of the prioritized points in the policy for the provision of distance education in South African Universities as set out in the Section 3 of the Higher Education Act, 101 of 1997. The key provisions of this policy are:

- Providing a system wide definition for what constitutes distance education provision.
- Supporting well-managed growth in quality distance education provision, including in institutions other than UNISA.
- Ensuring that distance education provides not only opportunities for access but also a reasonable chance of success.
- Ensuring that distance education provision is funded based on empirical evidence of relative costs of different modes of provision.
- Strengthening capacity to evaluate distance education provision and hence to regulate who can offer accredited distance programmes.
- Promoting the development and use of Open Educational Resources (OERs)
- Creating an enabling environment for appropriate integration of ICT to enhance distance education provision in both public and private universities as well as other post-schooling institutions (DHET 2014).

Moreover, it is important to note that initial teacher education programme by distance in South Africa is largely provided by the University of South Africa (UNISA), the only government funded ODL based university in the country. Apart from the operations of UNISA which are purely by distance, some of the conventional universities in the country also operate distance learning programmes to train teachers, although, these conventional institutions created autonomous units to manage their distance learning programmes. In addition, there are few numbers of Further Education and Training (FET) Colleges in all the nine Provinces of the country which also provides teacher training programmes by distance, as well as a number of private teacher training institutions that are approved by the Department Of Higher Education and Training (DHET).

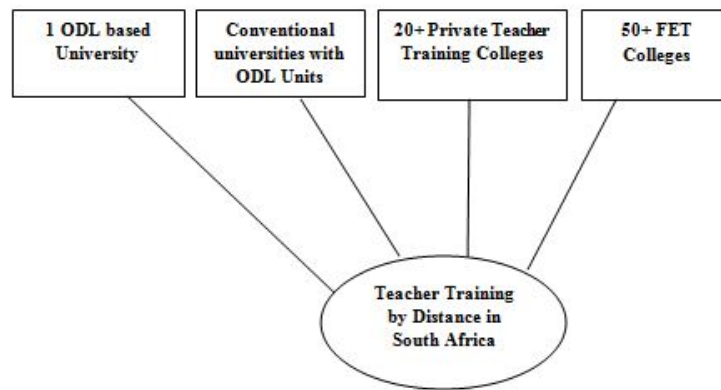


Figure 1: Providers of Distant Teacher Training Programmes in South Africa

2.2 Teacher Training By Distance in UNISA

The thriving of open and distance education in South Africa could be traced to the year 1946 when the University of South Africa was established (Pityana 2007). The University of South Africa has a long and respected history in teacher education by distance in Africa. The College of Education of UNISA is initiating relevant teacher education programmes aimed at strengthening the education sector of the country. The college offers the major courses/disciplines in the school curriculum and the Further Education and Training phase with a particular focus on language education, mathematics, science, inclusive education, technology and environmental education, adult and lifelong education, early childhood development, curriculum studies and instruction, educational foundations and school leadership and management. Pre-service teacher training in UNISA covers Bachelor of Education degree (in FET, intermediate and senior phase) degree which normally runs for four years, as well as the Post Graduate Certificate in Education (PGCE) targeted at those who are already in possession of Bachelor degree in Arts, Sciences and other fields outside the Faculty of Education. The initial teacher education programme by distance in UNISA is equipping the trainees with the pedagogical content knowledge as well as practical training, all aimed at producing competent teaching personnel who will be willing to join teaching profession in the country.

2.3 Teacher Training by Distance in Traditional Public Universities and Private Colleges in South Africa

Apart from the University of South Africa which operates mainly by distance, a few of the conventional universities and private colleges in the country also offers teacher training programmes by distance. Prominent among them is the professional development training programme targeted at the in-service teachers run by the Distance Learning Unit of the University of Pretoria. The centre's distance education courses reach more than 25,000 students who are mostly teachers that are improving their qualifications (Times Higher Education, 2015). The university's television and web-based training school are parts of the innovations adopted to take education closer to the door-step of people without them leaving their homes or workplaces. Similarly, also worthy of note are the Units for open and distance learning of the University of Free State and North West University which have been drawing learners from all walks of life that would previously not have been able to attain higher education. The teacher training programmes by distance of the two institutions are enabling prospective and in-service teachers to enroll for teacher training programme with the aim of entering teaching profession. Similarly, there are more than 20 private colleges as well as Further Education and Training Colleges providing teacher training programs by distance to those who are in one way or the other restricted by the constraints of location and time.

2.4 E-resources available to Distant Teacher Trainees in South Africa

The term 'e-resources' is a general term that encompasses varieties of digital materials and collections for learning. The words like cloud library, virtual library and electronic library are also used as umbrella terms to describe digitized libraries that houses collection of e-resources. Moreover, e-learning resources are also seen as hard learning materials converted into electronic forms which can be accessed by classroom based learners as well as distance learners without any difference in the location and time of access (Reitz 2004). These e-resources are usually accessed with the aid of devices such as computer, radio and television sets, mobile

phone, among others. In most cases, these devices are also counted as parts of electronic resources for learning.

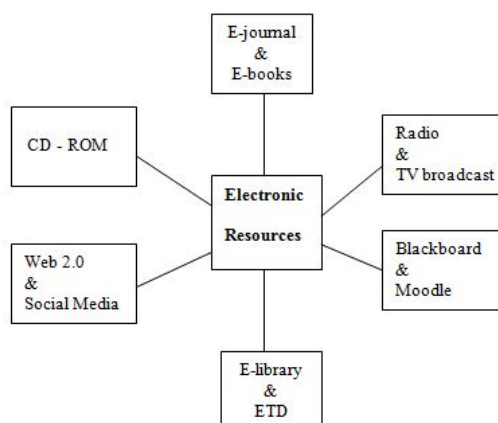


Figure 2: Commonly used E-resources in ODL Institutions

The introduction of e-resources for teaching and learning activities became prominent in the second half of the 20th century as more conventional universities and colleges became 'dual-mode' institutions, offering both face-to-face distance learning programmes (Butcher 2015). While there are opportunities for the students attending traditional institutions to physically visit library and consult their tutors on one-on-one basis within the institution on any matter relating to their studies, distance learning students rely majorly on the internet and whatever type of support system provided by their institutions to access learning materials and get feedback where necessary. This, therefore, made it mandatory for the institutions providing open and distance learning to think hard about quality and ease of accessibility while making educational resources available to clientele, particularly those studying to become professional classroom teachers. The reason is not far-fetched; the quality of educational resources that are available and accessible to teacher trainees, especially those in the initial teacher education phase, will go a long way in shaping their perception and competence in utilizing such resources when they eventually become professional classroom teachers. Moreover, since distant teacher trainees rely majorly on electronic resources in realizing the goal of their training programmes, efforts must be made by the training institutions to equip them with the necessary skills and knowledge both to effectively access and utilize the resources, both to study and practice.

A range of electronic resources are available and accessed by those studying to gain teaching qualification by distance in South African institutions ranging from audio-visual lectures, electronic books and journals which they usually accessed through their institutions' repositories and e-library services. Other e-resources available to pre-service teachers, as highlighted in Fig 2, include CD-Rom, television broadcast, and electronic mail, as well as the learning management systems such as Blackboard and Moodle, among others.

3. Rationale for this study

A range of studies (Kinshuk et al 2003, Johnson et al 2004, Salmon 2005, Rezaei 2006, and Butcher 2015) have been carried out on the importance of electronic resources to the success of teaching and learning engagements in open and distance learning institutions. Though these studies made profound contributions to the debate on the availability and relevance of electronic resources to teacher training institutions, they seems not to have address the issue of e-learning resources utilization by teachers in the classroom settings. This study, therefore, sought to fill this gap by exploring the experiences of distant pre-service teacher trainees while accessing and utilizing electronic resources and provide recommendations that can further help the institutions offering teacher training by distance in producing competent teaching personnel that meets the demand for quality teaching and learning in today's elementary and high schools.

4. Theoretical Framework – Technology Acceptance Model

The theoretical framework for this study was based on the Technology Acceptance Model (TAM) of Davis (1986), which emphasized the use of Theory of Reasoned Action (TRA). Theory of Reasoned Action, according to Davis, assumed that attitude of a person towards a system is controlled by his/her belief on that system.

Similarly, Technology Acceptance Model also deals with the acceptability of an information system (Adeyemo, Adedoja and Adelere 2013) and how it can be applied to determine level of acceptability of the system. Furthermore, TAM model assumes that level of acceptability or actual use (AU) is mainly determined by two factors, namely; Perceived Usefulness (PU); and Perceived Ease of Use (PEU).

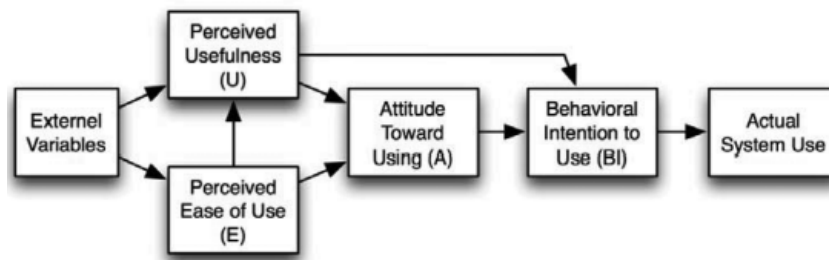


Figure 3: TAM Model Showing the Association between PU, PEU and Actual Use (Davis in Adeyemo, Adedoja and Adelere 2013)

The Perceived Usefulness (PU) of a system can be described as the level to which an individual believe that using the new technology or system will boost his/her performance (Bhatti 2015), while Perceived Ease of Use (PEU) refers to the extent to which a person believes that making use of a particular system or technology to perform a task will be easier or require little effort (Lu et al 2014). Moreover, Davis (1986), through his TAM model, clarified that an individual's attitude towards a system is not the only factor that influences him/her to use the system, the effect that the system will have on the person's performance is another significant factor that determines level of acceptance.

Several studies (Shen et al 2006, Padilla-Meléndez et al 2013, Calisir et al 2014, Teo and Noyes 2014, Ayeh 2015) have used Technology Acceptance Theory to explain users' acceptance and use of instructional and web based systems, including e-learning. For instance, Shen et al (2006) examined the degree to which subjective norms influence the perception of students towards accepting and using course delivery modes. Findings of the study revealed that facilitators' influence had significant impact on the students' perceived usefulness (PU). This finding revealed the impact of facilitators' role in shaping the perception of students learning delivery system. Similarly, study conducted by Bhatti (2015) on factors influencing the adoption of mobile commerce revealed that user's willingness to use mobile commerce platforms is influenced significantly by perceived ease of use (PEU) and perceived behavioural control. Drawing lessons from the previous studies, therefore, the current study found relevance of TAM as an important predictor of perception and attitude of pre-service teacher trainees towards e-learning resources.

5. Methodology

Methodology in a research study is simply 'the act and science of doing research' usually provides answers to the 5W questions in research, i.e. what, why, who, which, and where. Therefore, this section discusses the manner in which this study was conducted using various subtitles as itemized below.

Research Design: This study adopted quantitative method to collect data that provided answers to the research questions for the study. Leedy and Ormond (2008) note two popular approaches which a research study can employ, i.e. quantitative and qualitative methods. Quantitative research study provides answers to questions on the association between variables with the aim of clarifying and predicting phenomena (Williams 2011), while qualitative study attempts to answer questions on the compound nature of phenomena by explaining these phenomena from the perspectives of the study participants (Leedy and Ormond 2008). This quantitative study was conducted through survey that employed semi-structured questionnaire completed by pre-service teacher trainees in the selected ODL based universities.

Research Instrument: Since the participants were distance learners, web-based survey, which was designed on Google doc, was used as data collection instrument. The link to the survey was posted directly to the participants by the ICT units of the selected institutions. This was to ensure total anonymity of the student teachers that participated in the study.

Participants: Distance learning based pre-service teacher trainees in selected South African universities served as the participants for this study. The teacher trainees selected were in the third year of their Bachelor of

Education (B.Ed.) degree programme. 70 participants were purposively selected in each of the three universities, making the total of 210 respondents. However, only 144 pre-service teachers responded to the survey instrument which represents 68% of the participants.

Data Analysis: The data collected were analyzed using descriptive statistics of percentage and frequency counts. The data obtained from the survey were presented in pie chart below.

6. Findings of the Study

Frequency of use of e-resources

How often do pre-service teachers use e-resources?

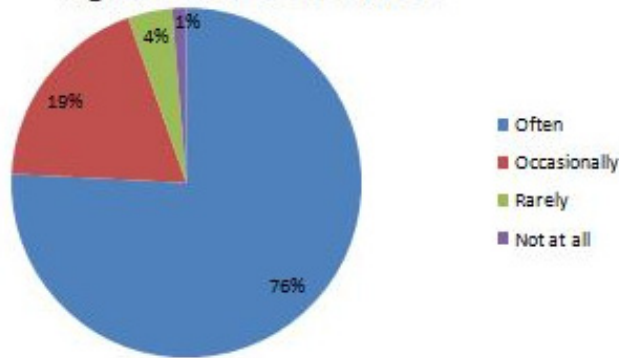


Figure 4: Use of e-resources

As can be noticed on the figure 4, the vast majority of participants use electronic resources on a daily basis.

In the survey distributed among the respondents, they were asked to state the specific types of electronic resources being accessed and used regularly. Some of the popular e-resources mentioned were internet, email, Facebook, Youtube, Blackboard and Moodle, e-journals, e-books, laptop, mobile phone, television, electronic database of thesis and dissertation, among others.

Commonly accessed electronic resources

What e-resources do you access most?

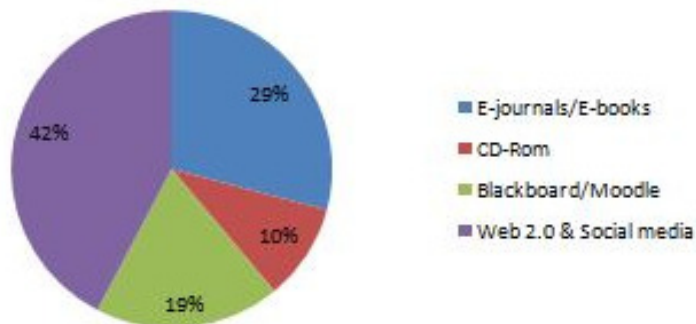


Figure 5: Most accessed e-resources

In the survey, the participants were specifically asked which electronic resources are widely accessed and used by the pre-service teachers. As seen on the figure 5, electronic journals and books, CD-ROM, blackboard, moodle, web 2.0 and social media were the major e-resources identified by the respondents. It is very interesting to note that majority of the participants identified web 2.0 and social media platforms, as their most accessed and used electronic resources. The findings suggest that today's distance learners have constant presence on social media, especially Facebook, which they use majorly to socialize and share knowledge among one another.

Frequency of utilization of e-resources

How often do you utilize e-resources to teach?

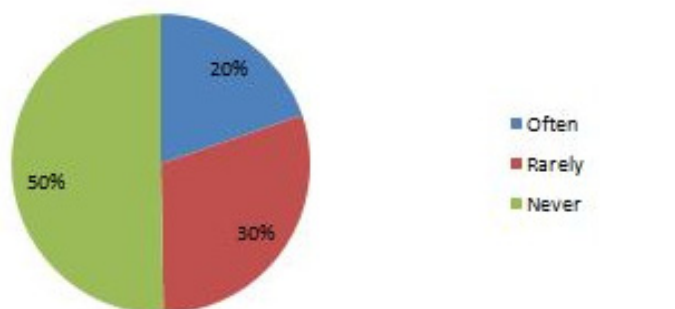


Figure 6: Level of utilizing e-resources

Figure 6 shows the responses of the participants on the level of utilization of electronic resources in the classroom. As revealed in the figure, only 20% of the respondents often utilize e-resources to teach in the classroom, 30% rarely utilize e-resources while the majority (i.e. 50%) has never utilized electronic resources to teach in the classroom during their teaching practice.

Do you think you need more training on how to utilize e-resources to teach in classroom?

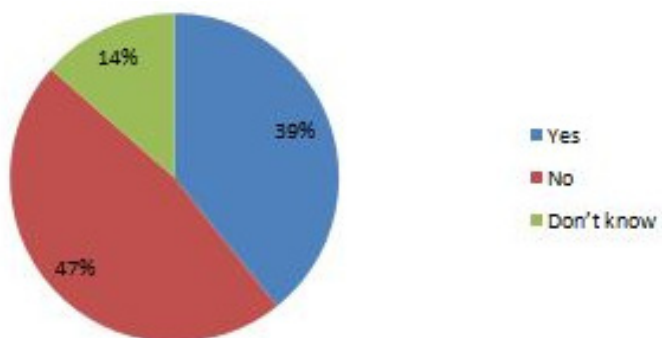


Figure 7: Further training on e-resources

Through the review of literature and other operational documents about teacher training programmes by distance in South Africa, we found that most of the distance learning institutions usually provide some sorts of virtual training for their students on e-resources and other learning expectations while entering the programme. To ascertain if the training was enough, the participants were asked if they feel they still need further training, specifically on accessing and utilizing electronic resources. On Fig. 7, it is clear that while the largest group of respondents (47%) do not believe they need further training, though a significant portion of the respondents (38%) feel they do.

What is the main device through which you access e-resources?

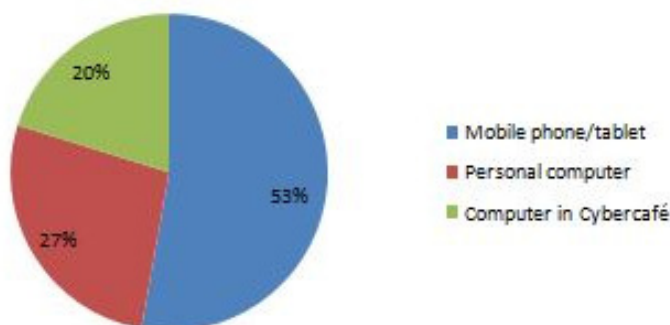


Figure 8: Devices used in accessing e-resources

Figure 8 shows the participants responses on the devices used in accessing the available electronic resources. A range of devices such as tablet, personal computer, computer in the public library, computer in the institutions' resource centre, computer in cybercafé, and mobile phone were identified as major devices used in accessing e-resources for learning. It is noteworthy that majority of the respondents (53%) selected mobile phone and tablet as the major devices used to access electronic learning resources.

What is the main source of your internet connection?

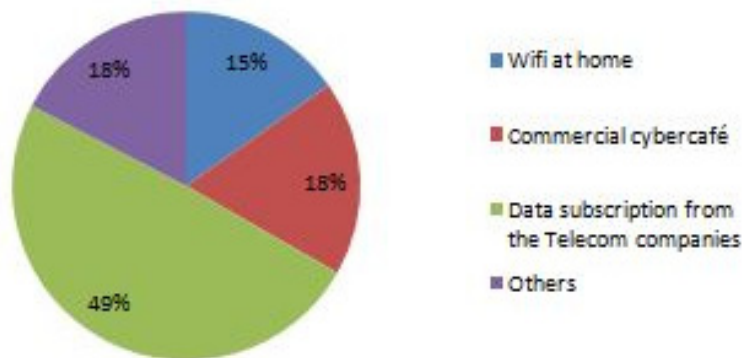


Figure 9: Sources of internet connectivity

Participants were also asked to indicate their main sources of internet connectivity. As shown in Fig. 9, 15% of the respondents accessed internet by connecting to their private wifi at home, 18% ticked commercial cybercafé as their main source of internet connectivity, while the majority group (49%) indicated data subscription from the telecommunication companies as their major source of internet connectivity. This is so because majority of the respondents uses mobile devices, e.g. mobile phone and tablet, as their major devices of communication as well as accessing electronic learning resources.

What are the main challenges you usually encounter in accessing and utilizing e-resources?

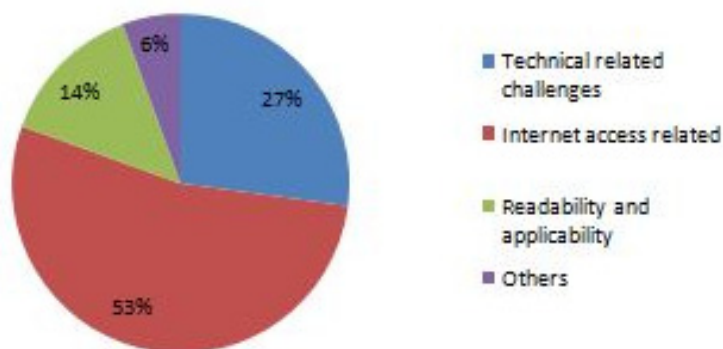


Figure 10: Challenges in accessing e-resources

In the anonymous web survey sent out to the participants, they were giving the opportunity to state the specific challenges they face in their quest to access and utilize e-resources. After retrieving the data on the survey, their responses were classified into three categories, i.e. technical related challenges, readability and applicability challenges, as well as internet access related challenges. For clarity sake, technical related challenges apply to the failure encountered by the learner as a result of inadequate skill or knowledge to access or utilize electronic resources. Readability has to do with the ability or inability of the learner to read, listen or watch clearly the content of e-resources being accessed, which may happen as a result of the disability in learner or the inappropriate nature of the e-resources being accessed or utilized at a given time. Internet access related challenges simply refer to the poor/unstable nature of internet connection or the inability of the learner to afford internet connection which limits his/her level of access to e-resources. As shown clearly in the figure 10, the majority of the respondents (53%) identified internet access related challenges as their main constraint to accessing and utilizing electronic resources.

7. Limitations of the Study

The study explored the experiences of pre-service teacher trainees by distance in accessing and utilizing electronic resources. Though the study is used to draw some certain conclusions, it is imperative to note the limitations of this study so that it can be viewed in the correct context in which it was conducted.

- a. The number of the respondents sampled may not be the true representation of the entire learners studying to obtain teaching qualification by distance in South Africa. It is important to note again that the number of the participants who responded to the survey was reported as sample for the study. However, the inability of some of the pre-service teachers to respond to the survey could also be to the fact that they were constrained by the problem of Internet access.
- b. Also, the study covers only institutions that are using open and distance learning to train pre-service teachers. It is very important for the future researchers to look into the level of access and utilization of e-resources of pre-service teacher trainees in the traditional campus based institutions.

8. Discussions of Findings, Conclusion and Recommendations

The important role of electronic learning resources in the actualization of goals and objectives of distance education cannot be overemphasized. From the analysis of the data collected through survey, some significant insights have been gained into the level of access and utilization of e-resources by pre-service teachers, in line with the perceived usefulness (PU) and perceived ease of use (PEU) put forward by the proponent of the Technology Acceptance Model (TAM). Through the findings, one can establish a significant gap between the level of access to e-resources and the utilization of the resources accessed by the respondents as it shows clearly that while the electronic resources are available and accessed, the majority of the distant pre-service teacher trainees have not been utilizing the e-learning resources in the classroom. This may imply that the respondent did not have the requisite knowledge and skills to effectively utilize e-resources for classroom teaching. This corroborates the findings of Adeyemo, Adedoja and Adelore (2013) which established inadequate computer skills as one of the major factors responsible for learners' inability to utilize learning technology. Here we use the word 'utilization' to mean 'actively engaging materials to produce stimulating learning experience not only for oneself but also for others'. Hassan and Olaniran (2011) also emphasized the need for institutions of higher learning to expose students to the necessary skills that will prepare them for today's knowledge economy. It is also interesting to note that the use of radio broadcast is not pronounced by the respondents as one of the most accessed and used learning resources. This may be as a result of the absence or dysfunctional state of the radio stations in the distance learning institutions where the participants were drawn from. Another interesting to note in the study is the use of mobile phone as a major platform for accessing e-learning resources by the participants. This confirmed the finding of (Dalvit et al, 2014) that mobile phone has great potential in enabling learners to gain large exposure to the learning content as mobile devices give one opportunity to do self-learning anytime, anywhere with the assistance provided by mobile technology. Similarly, the result of the survey shows that majority of the distant teacher trainees were constrained by the internet connection problem. This may result from the inability of the respondents to afford the internet data bundle rates which may give them constant internet access on their mobile phones and tablets. Also, as noted on the fig. 6, few of the participants wanted to be trained in how to use e-learning resources for educational purposes. This demonstrates that there is little transfer between using e-resources for their own learning and incorporating e-resources meaningfully into their teaching learning activities.

Based on the findings of the study, therefore, the following recommendations were made:

1. Adequate training of pre-service teacher trainees on information technology, especially the tool that are specifically useful for classroom teaching, as well as the techniques of utilizing the tools. This will enable the teacher trainees to master the use of the available e-resources in carrying out their academic studies, as well as utilizing them for practice. Adeyemo, Adedoja and Adelore (2013) also advocated for capacity building training for students in institutions of higher learning in the area of learning technology to boost their level of access and use.
2. Establishment of radio stations by the institutions providing open and distance learning programmes which will be used purposely for teaching, learning and information dissemination. This is because radio has been found to be the commonest, cheapest and most powerful means of communicating ideas and disseminating information to a large group of people at the same time (Olaniran, 2013).

3. Efforts should be made by open and distance learning institutions to collaborate with telecommunication companies that provide internet data services for the purpose of negotiating subsidized and affordable Internet services for distance learners. This will be of significant help, especially to those studying to gain teaching qualifications since most of them access e-resources mostly from their mobile phones. Constant internet services to teachers gives unhindered accessibility to pictures, videos and other instructional materials which has been proved to be one of the major catalysts for enhancing classroom based teaching and learning activities (Olaniran, 2015).
4. There also a need for the institutions providing open and distance education to take social media as one of the major channels of sharing learning resources among learners. Since majority of distance learners make use of social media platforms like Facebook, Twitter, and LinkedIn, for socializing and networking among peers, making learning resources available through such platforms will further enable distance learners to access and share resources among each others. Bosch (2009) also found the use of social media platforms like Facebook, Youtube and Wikis for teaching and learning more stimulating and engaging for today's learners.

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