

## Higher Education Students' Utilisation of Information and Communication Technology with Special Reference to My Vista: Benefits, Challenges & Opportunities

Nkululeko Sibanda<sup>1\*</sup>, Douglas Gasva<sup>2</sup>, Wisdom Moyo<sup>3</sup>

<sup>1</sup>Centre for Student Management, Zimbabwe Open University Harare, Zimbabwe

<sup>2</sup>Quality Assurance Unit, Zimbabwe Open University Harare, Zimbabwe

<sup>3</sup>Lecturer, Faculty of Applied Social Sciences, Zimbabwe Open University Harare, Zimbabwe

\*Corresponding author: Nkululeko Sibanda

| Received: 12.11.2018 | Accepted: 22.11.2018 | Published: 30.01.2019

DOI: [10.36347/sjahss.2018.v07i01.005](https://doi.org/10.36347/sjahss.2018.v07i01.005)

### Abstract

### Original Research Article

The current study adopted the qualitative research methodology and descriptive research design. The target population of the study was composed of registered students enrolled at Matabeleland North Regional Campus of the Zimbabwe Open University during the January to June semester of 2018. Convenient sampling was used to come up with a sample of 30 (n=30) undergraduate students and Interviews were utilized as the research technique for the purposes of generating data from the participants. The gathered data was presented in prose form and the major findings of the study were that most of the students enjoyed the multiple benefits of using MyVista as it generally enhanced their studies. However, a number of students within the area under study lacked ICT skills considering that most of them came from predominantly rural areas where access to ICT is generally limited. In addition, there were limited ICT resources particularly computers connected to Internet at the Regional Campus. However, study findings revealed a number of opportunities related to the use of the platform by the students in the area under study. These included the fact that most students generally possessed smart phones which they can use in the place of computers to access the platform. In addition, a number of students were convinced that the platform made their studies and communication a lot easier and was also in tandem with global ICT developmental trends. Accordingly, the study recommended that The study concluded that most students at Matabeleland North Regional Campus of the ZOU enjoyed the multiple benefits of using MyVista. Generally, its use by students was largely associated with several benefits and opportunities though there were some challenges which were however not insurmountable. Based on the findings and conclusion, the researchers recommended that the Regional Campus steps up its efforts in liaison with the National Centre in ensuring that all students were comfortable with the use of MyVista considering that it enhanced their learning and made it a lot friendlier. This could also be through strengthening the role of the region's MyVista help-desk in order to ensure that students in need are effectively assisted.

**Keywords:** Information & Communication Technology, E-learning, MyVista, higher education, open and distance learning.

**Copyright © 2019:** This is an open-access article distributed under the terms of the Creative Commons Attribution license which permits unrestricted use, distribution, and reproduction in any medium for non-commercial use (NonCommercial, or CC-BY-NC) provided the original author and source are credited.

## INTRODUCTION

Today's higher education institutions are experiencing new issues and trends; all of which are largely associated with some benefits, challenges and opportunities. This is particularly so in this age that is characterised by the globalisation of knowledge and rapid technological developments. To this day, so many changes have taken place within higher education and many of these trends have largely been centred on the adoption and utilization of Information and Communication Technology (ICT) to facilitate the teaching-learning process [1]. Developing countries

such as Zimbabwe are taking significant strides in acknowledging and implementing ICT initiatives, and in that regard, higher education has not been left behind. In an effort to match the developed world, most developing nations are investing on infrastructure for ICT and focusing on technology-mediated learning approaches in order to match the changing learning styles [2]. The major purpose of adopting ICT in education has been stated as "to improve and increase the quality, accessibility and cost-efficiency of the delivery of education, while taking advantage of the benefits of networking learning communities together to

equip them to face the challenges of global competition [3].”

Education is a socially oriented activity and quality education has traditionally been associated with strong teachers having a high degree of personal contact with learners. However, in modern times, the use of ICT in education including open and distance learning (ODL) has been used to remove communication barriers such as that of space and time between educators and learners [4]. This has since been experienced at the Zimbabwe Open University (ZOU), which, since its founding in 1999, is the largest ODL university in Zimbabwe and second largest to University of South Africa (UNISA) in Southern Africa [7]. ZOU is a multi-disciplinary inter-faculty institution offering degree and non-degree courses through distance teaching and open learning to adult learners and evolved after the Zimbabwean government had realized that there was need to develop distance education and open learning to cater for a substantial component of the populace, who, intentionally or unintentionally, could not be accommodated in conventional universities [5, 1].

In its endeavour to position itself in the ICT era, the ZOU has come up with an innovation called My Vista which Choga [8] notes to be an E-learning mode that was introduced by the institution in 2012. As eluded by Chimedza [9], this possibly marks the attainment of the third and last generation stage in the evolution of ODL, largely characterised by E-learning. For Chimedza (ibid), this stage involves the use of the Internet, the World Wide Web, E-mail, V-sat and so forth; and in this modern mode, students continue to interact with the tutor and with other students but mostly electronically. As one of the E-learning platforms, MyVista essentially enhances the delivery and quality of ODL as it is consistent with the call of the hour which is the need to electronically provide education for everyone, anywhere, and at any time! It is against this background that the study explored the key issues associated with the adoption of ICT in higher education, with special reference to the benefits, challenges and opportunities associated with the use of MyVista at Matabeleland North Regional Campus of the ZOU.

### Statement of the problem

While the new trend of ICT adoption has been a welcome development in many spheres including higher education considering that it is largely associated with both benefits and opportunities, the use of MyVista has, however, been confronted with some challenges.

### Purpose of the Study & Research Questions

To ascertain key issues concomitant with the adoption of ICT in higher education; in particular, the

benefits, challenges and possible opportunities associated with the use of MyVista platform.

Based on the above purpose, the following research questions guided the study;

- What are the views of students regarding the benefits of using ICT in higher education?
- What challenges do students face in the use of MyVista and how best could these challenges be addressed?
- What possible opportunities are available in the use of MyVista at the ZOU?

### Significance of the Study

It is envisaged that the study would be of significance to the ZOU in general and its Matabeleland North Regional Campus in particular as it is expected to illuminate key issues associated with the utilisation of MyVista by students. Thus, the researchers anticipated that the institution and the regional campus in question will take advantage of the findings of this study to improve on the administration of the platform in order to enhance the ODL teaching and learning practices being undertaken in line with the University’s mandate of upholding excellence.

## REVIEW OF RELATED LITERATURE

### Conceptualising Information and communication technology (ICT)

Although there is no single, universal definition of ICT, the term is generally accepted to mean all devices, networking components, applications and systems that if combined; allow people and organizations to interact in the digital world. According to William and Roger [10];

*Information and communication technology (ICT) is another or extensional term for information technology (IT); which stresses the role of unified communications and the integration of telecommunications (telephone lines and wireless signals), computers as well as necessary enterprise software, middleware, storage, and audio-visual systems, which enable users to access, store, transmit, and manipulate information.*

Thus, ICT is sometimes used synonymously with IT (for information technology); but, however, ICT is generally used to represent a broader, more comprehensive list of components related to computer and digital technologies than IT. Broadly, ICT entails the acquisition, processing, storage and dissemination of vocal, pictorial, textual and numeric information via the microelectronic-based combination of computer and telecommunication [11, 3]. It encompasses both the Internet-enabled sphere as well as the mobile one powered by wireless networks and also includes antiquated technologies, such as landline telephones, radio and television broadcast; all of which are still widely used today alongside cutting-edge ICT pieces such as artificial intelligence and robotics [3]. It is

within this broader context of ICT that the current study focused on the My Vista platform; which is basically an ICT platform that is used to facilitate and enhance teaching and learning.

### **Benefits of the Utilisation of ICT in general and MyVista in particular in Higher Education**

Many authorities [12, 13, 8] concur that there are a number of benefits that can be accrued through ICT utilisation and use of a specific E-learning platform. As noted by Dickison (*ibid*), ICT generally presents an entirely new learning environment for students, thus, requiring a different skill set to create opportunities for increased success in their studies. With ICT, critical thinking, research and evaluation skills are growing in importance as students have increasing volumes of information from a variety of sources to sort through. In that regard, ICT acts as a powerful agent to change many of the educational practices accustomed by institutions of learning including colleges and universities [10]. ICT allows for the creation of digital resources like digital libraries where students, tutors and other professionals can access study and research material as well as particular course material from any place at any given time [14]. Such facilities allow for quick and easier access to information by ODL learners, as well as the networking of academics and researchers, hence, sharing of scholarly material.

As students and educators gain access to ICT, more forms of communication, and access to sharable resources, the capability to support these quality learning standards will continue to grow. Groff [15] avers that innovative ICT technologies not only have the potential to evolve pedagogical practice, but also completely transform entire learning environments. When technology is leveraged with a very strategic vision and change management plan, the results can be both revolutionary and transformational. Mondal and Mete [16] indicate that when such technologies are used for educational purposes, namely to support and improve the learning of students and to develop learning environments, ICT can be considered as a subfield of Educational Technology.

In higher education open and distance learning (HEODL), ICT provides new educational approaches as it can provide speedy dissemination and access of information by target groups [17, 11]. UNESCO (*ibid*) further notes that in education, ICT enhances the international dimension of educational services and also develops higher order skills such as collaborating across time and place and solving complex real world problems [18, 19]. In other words, it improves the perceptions and understandings of the world by the students [20]. Lim and Hang [21] advanced three major reasons for ICT in education; suggesting that it is a tool for addressing challenges in teaching and learning

situations, a change agent and central force in socio-economic competitiveness.

ICT also underpins broad shifts in society, as individuals are moving from personal, face-to-face interactions to ones in the digital space. This new era is frequently termed the Digital Age. However, for all its revolutionary aspects, though, ICT capabilities aren't evenly distributed. Simply put, more developed countries and communities as well as richer individuals enjoy more access and, thus, have a greater ability to seize on the advantages and opportunities powered by ICT. Consider, for example, some findings from the World Bank [22] which stated that more than 75% of people worldwide have access to a smart cellphone. However, Internet access through either mobile or fixed broadband remains prohibitively expensive in many developing countries due to a lack of ICT infrastructure.

Furthermore, the World Bank (*ibid*) estimated that out of the global population of 7.4 billion people, more than 4 billion don't have access to Internet connectivity, and additionally, it estimated that only 1.1 billion people have access to high-speed Internet. The United Nations [23] considers one of its Sustainable Development Goals (SDG) to be "to significantly increase access to information and communications technology and strive to provide universal and affordable access to the Internet in least developed countries by 2020." Thus, the need to increase access to ICT utilisation is related to the realization that those disadvantaged are left out of the multiple opportunities and benefits that ICT offers and will, therefore, further fall behind in educational enlightenment.

Globalization and technological change processes that have accelerated in tandem over the past years have created a new global economy powered by technology, fueled by information and driven by knowledge. This development has serious implications for the nature and purpose of educational institutions including higher education. Technology in education should not be considered as a replacement for face-to-face instruction but rather as a support to "attain objectives that have not been attained efficiently otherwise: expanding access, promoting equality, improving the internal efficiency of educational systems, enhancing the quality of education, and preparing new and old generations for a technology-driven market place" [24]. The field of education has in many ways been affected by ICTs, which have undoubtedly positively influenced the quality of teaching, learning, and research. The benefits of technology in education have been lauded for many years, from Thomas Edison's 1910 proclamation that film would transform education, making books obsolete to the most recent phenomenon of using the Internet for teaching and learning [25].

ICTs have the potential to innovate, accelerate, enrich, and deepen educational skills, to motivate and engage students in learning endeavours, to help relate school experience to work practices as well as strengthening teaching and helping schools to transform [25]. Technology provides a motivating learning environment whereby learners are given the opportunity to be constructively engaged with instruction. Research has revealed that, if properly implemented, learners can reap the pedagogical benefits of technology in many ways, and accordingly, experts today increasingly advocate for the implementation of the constructivist model of learning rather than the traditional instructivist model [10]. ICT has also been recognised as providing a means of helping schools achieve the goal of promoting equal access to education [15]. Also, it has the potential to offer increased access to education to students of different characteristics including those with disabilities. ICT also provides student support services such as course outlines, digitally recorded classroom material, discussion groups, laboratory assignments, lecture notes, live lectures for later viewing and re-viewing, links to course specific websites, online tutorials, supplementary readings, and virtual office hours for teacher-student consultations [26].

The modern use of electronic educational technology also facilitates distance and independent learning by the extensive use of ICT, which consequently replaces traditional or conventional mode of content delivery, thereby creating a virtual community of learners sustainable across time and serving large numbers of learners [27]. Research by Thomson [1] and Hashey and Stah [30] revealed that the use of MyVista in particular motivates students through digital interaction with their tutors as well as group emailing and students have more time to think while also developing a sense of community of learners which Dyrbye *et al.* [23] referred to as ‘building team-learning dynamics’. In addition, students who enroll using MyVista often find that their academic needs are met and their technological skills improved [28, 29]. In the context of higher education institutions, ICT applications further provide a competitive edge by offering enhanced services to students and faculty, driving greater efficiencies and creating enriched learning experiences as, for example, students undertaking an ODL programmes have neither time nor location dependencies [31].

### **Challenges and Opportunities associated with ICT utilisation with special reference to MyVista in Higher Education**

Despite the keenness of some institutions of higher learning to effectively utilise ICT, they are often confronted with operational challenges that may impede the proper implementation of their programs. Besides the lack of infrastructure to accommodate the technology, problems in electricity, network availability, lack of awareness towards technology and

its utilization all add to the complexities associated with the successful implementation of ICT in educational institutions [32]. Many of the institutions in the developing world are generally still in a nascent stage in the integration of ICT in their programmes and are still accustomed with traditional teaching and learning practices. In addition, lack of motivation and inadequate knowledge among teachers and learners to adopt ICT in teaching are the other challenging factors for the potential benefit of ICT in higher education [22].

Mafa and Mpofu [13] cited in Mafa and Gasva [13] also noted that while technology-driven pedagogy is largely characterised by enormous benefits, it is not spared from facing some challenges. For them, the major challenge associated with the adoption of technology-driven pedagogy is lack of financial resources which may not be readily available, for example, to acquire and set up appropriate infrastructure, attract personnel with requisite qualifications to manage the E-learning resources as well as pay service providers. Thus, even though students can benefit immensely from well-produced learning resources, E-learning has its own unique challenges as not all faculties are ICT literate and can effectively facilitate learning using ICT tools, a challenge that consequently cascades to offering problems for the ultimate beneficiaries who are the learners. In addition, poor economic conditions and their effect on low and middle income earners also stand as a major barrier to the effective utilisation of ICTs in higher education for the intended beneficiaries will normally operate with limited or no access to E-resources such as computers and smart phones [23].

The digitization of educational data, the expanding use of high-speed Internet and the growing global network together have led to new levels of crime, where so-called bad actors can hatch electronically enabled schemes or illegally gain access to compromise scholars’ intellectual property or to disrupt systems that control critical infrastructure. Within higher education institutions, ICT utilisation including the My Vista platform by students have also posed challenges in that students have been limited in their interaction with their tutors and others, creating what some people fear is a population that could lose some of what makes it human [12]. Reporting on the general challenges of using the My Vista platform, Thomson [1] asserted that students may also not feel comfortable to email their tutors and consequently, frustration may creep in when technology does not perform properly, yet, the tutor cannot tell when a student becomes distressed.

Dyrbye *et al.*, [23] also pointed out that students may also not understand and misinterpret their learning content as well as miss the contextual cues and body language that tutors would physically provide for learners. In addition, lack of classroom presentation and visual stimuli typical of tutorial sessions hampered

learning and that lack of face-to-face interactions between tutors and students also impeded relationship building between both the students and the tutor [23]. Furthermore, Choga (ibid) noted that there were some challenges in using My Vista at the ZOU, as during one of the tutorial sessions with a class of undergraduate students in 2015, most of the students were not aware of the system, and very few used to check their results using the system, with some facing problems in logging on the system.

Kremer [33] corroborated by Muuro [34] averred that cheating was also a big possibility in online learning and that lack of participation by peers as they do not have time and lack of feedback from tutors as well as poor Internet connectivity were all challenges experienced in online learning. In a related study, Mafa and Gasva (ibid) found out that though ZOU was progressing well on utilizing technology-driven pedagogy in offering its ODL programmes, the development was besieged by some challenges, including inadequate computers at Regional Centres, limited Bandwidth for Internet connectivity, high initial costs to the University, limited computer literacy of both tutors and students, unreliable Internet network coverage in remote areas and the risk of increased cases of plagiarism by students.

However, despite the prevailing challenges, optimism for the realisation of ICT usage in higher education remains. The prospects for the successful use of ICT in teaching and learning in Zimbabwean higher education, for example, are positive, though there is much work left to be done. Ololube, Eke, Uzorka, Ekpenyong and Nte [35] affirm that the adoption of ICT in any country's higher education has clearly changed the way education is conducted and perceived. For them, not only is it possible to work with distance learning and achieve a closer collaboration between different institutions and stakeholders, but also paving the way for a new pedagogical approach where there is unparalleled ability to spread knowledge and disseminate information, making it more and easily accessible to learners. The pace of change brought about by new technologies such as My Vista has, thus, had a significant effect on the way students interact with their studies considering that ICT also possesses a great potential for educational capacity building as it allows for systematic gathering, processing and dissemination of information through the use of creative tools for managing and delivering any subject matter.

The commitment of most governments in investing on ICT usage in education is enormous, substantial and highly justified considering the general backwardness of most African nations in education. Groff [15] asserts that the depth and breadth of technologies available today affords learning environments much diversity and opportunity for leveraging ICT as a through-line for educational change

and transformation. Intersecting that with the incredible array of learning environments across the globe, we are left with a spectrum of examples of this; thereby giving us a complex picture of what technology-rich learning environments are, and could, be. As another opportunity, Choga (ibid)'s study in concurrence with Dickinson (ibid) concluded and recommended that although the large number of students using My Vista ended up possessing satisfactory computer and Internet skills, the students still required continual guidance by tutors, hence, higher education institutions could increase the prospects of its effective use by introducing its help-desk to assist the students in need.

In the same vein, confidence building is more crucial at the initial stage and for all new students who need the support for the use of this very crucial platform considering that it largely enhances student learning and made the entire learning process a lot easier and friendlier [36]. A study by Roach and Lemasters [37] on student satisfaction with the use of MyVista also revealed that the prospect of success in the use of this platform lied in recognizing that students preferred timely feedback on assignments and that online class sizes should be small in order to increase student satisfaction. Thus, this optimistic view has also resulted in authorities like Sun *et al.* (ibid) and Muuro [34] producing a framework to guide E-learning satisfaction by higher education students which is essentially based on focusing on the quality of course material and timely feedback by tutors as well as the need to assist the learners in confidence building in computer usage in general and the use of appropriate learning platforms for which My Vista is a case in point.

## METHODOLOGY

The study adopted the qualitative research methodology and the descriptive research design was used to signpost the generation of data. The target population, described by Kuhn [6] as the totality of all subjects that conform to a set of specifications, comprising of the entire group of persons that are of interest to the researcher and to whom the research results can be generalized, comprised of registered students enrolled at the Regional Campus under study during the January to June semester of 2018. Convenient sampling was used to come up with a sample of 30 (n=30) undergraduate students who were distributed across the different Faculties. Interviews were utilised for the purposes of generating data from the participants and were considered most appropriate as they enabled the researchers to solicit for first-hand experiences of participants [38, 39].

In line with the recommendation by Frankel and Wallen [40] the researchers pre-tested the instruments with five undergraduate students who were not part of the study which allowed for the consolidation of items which were found to be unclear to participants. Consistent with qualitative inquiries

[41], the Thematic Content Analysis (TCA) technique was used after gathering data which enabled the researchers to present findings in a way that addressed

the key themes as reflected through the research questions.

## STUDY FINDINGS

### Study Findings

Benefits of using MyVista	Challenges of using MyVista	Possible Opportunities
<p>-Coming across large volumes of information from a variety of sources which would not have been possible with classroom face to face learning with tutors</p> <p>-Ability to access study and research material as well as particular course material from any place at any given time</p> <p>-Quicker and easier way to access information. Information sharing &amp; dissemination was, therefore, speeded</p> <p>-Ability to network with fellow students, thereby allowing the sharing of scholarly material as well as the creation of a community of learners</p> <p>-The learning process was generally supported and improved in a way that enabled students to acquire new information at the same time and at the same pace (promotion of equal access to education)</p> <p>-Improvement of learners' perceptions and understanding of the global learning environment and the world in general.</p>	<p>-Lack of ICT skills by some students considering that they came from predominantly rural areas where access to ICT is generally limited</p> <p>-There were limited ICT resources particularly computers connected to the Internet at the Regional Campus</p> <p>-Problems in regular availability of electricity and poor Internet connectivity at the Regional Campus</p> <p>-The effective integration of the use of MyVista as both lecturers and students were still accustomed with traditional teaching and learning practices</p> <p>-Lack of motivation and resistance to change towards ICT use by some students who lacked knowledge of the its potential benefits</p> <p>-Some students complained that their interaction with their tutors and other students had been limited unnecessarily which they felt made them lose what made learning a human activity.</p> <p>-Some learners felt uncomfortable to communicate their tutors online and consequently, became frustrated when MyVista failed to perform well.</p> <p>-Risk of increased cases of plagiarism by some unscrupulous students</p>	<p>-The fact that most students possess laptops and smart phones which they used in place of regional computers to access MyVista</p> <p>-A number of students were convinced that the utilisation of ICT had become the in-thing in higher education as it enhanced the teaching-learning process</p> <p>-The opening of District Centres was also revealed as a big relief by a number of students who felt that they provided a safety net in their studies</p> <p>-Some students simply supported the idea that the use of the platform was consistent with the institution's vision and mission as a world class University and was also in tandem with global educational developments</p>

## CONCLUSIONS AND RECOMMENDATIONS

The study concluded that most students studied enjoyed the multiple benefits of using MyVista. Generally, its use by students was largely associated with several benefits and opportunities though there were some challenges which were, however, not insurmountable.

Based on the findings and conclusion, the researchers recommended that Matabeleland North Regional Campus of the ZOU steps up its efforts in liaison with the National Centre in ensuring that all students are well inducted in and, therefore, comfortable with the use of MyVista considering that it enhances learning and makes it a lot friendlier. In addition, there is need to strengthen the role of the region and its district's MyVista help-desks in order to

ensure that students in need are effectively assisted in the use of this platform.

## REFERENCES

1. Thomson D. Conversations with teachers on the benefits and challenges of online learning for gifted students. *Gifted Child Today*. 2011 Jul;34(3):31-9.
2. SrivaSTava TK, Waghmare LS, Jagzape AT, Rawekar AT, Quazi NZ, Mishra VP. Role of information communication technology in higher education: Learners perspective in rural medical schools. *Journal of clinical and diagnostic research: JCDR*. 2014 Jun;8(6):XC01.
3. Ololube NP. ICT attitude and anxiety among Higher education Students: In A. Cartellia M. Palma (Eds). *Encyclopedia of information and Communication Technology*, 2008; pp 100-105.

4. Lim CP, Chai CS. An activity-theoretical approach to research of ICT integration in Singapore schools: Orienting activities and learner autonomy. *Computers & Education*. 2004 Nov 1;43(3):215-36.
5. Benza T. Zimbabwe Open University extends the frontiers of tertiary education beyond the traditional boundaries in Zimbabwe. *International Journal of Open and Distance Learning*. 2001;1(3):17-30.
6. Kuhn R. *Research in Education*. New York. Allyn and Bacon, 2006.
7. Rumajogee A. Distance education and open learning in sub-Saharan Africa: A literature survey on policy and practice. Ibadan, Nigeria: Association for the Development of Education in Africa. 2002.
8. Choga F. MyVista as a Learning Mode: Case of Zimbabwe Open University. *IOSR Journal of Research & Method in Education*, 2016; 6(3), 90-97.
9. Chimedza R. *New Student's Orientation Handbook*. Harare. Zimbabwe Open University, 2006.
10. William M, Roger S. ICTs. *Cultural Studies*, 1996; 5(2), 204-227.
11. UNESCO. *ICT in Education: A curriculum for schools and programme of teacher development*. France. Division of higher education report, 2002.
12. Dickinson J. *Enabling E-learning in Higher Education*, Florida. JED Publishers, 2005.
13. Mafa O, Gasva D. Increasing Access to and Quality of Open and Distance Learning Programmes through Technology-Driven Pedagogy: the Case of Zimbabwe Open University. *IOSR Journal of Research & Method in Education*. 2015;5(5):74-80.
14. Bhattacharya I, Sharma K. India in the knowledge economy—an electronic paradigm. *International journal of educational management*. 2007 Aug 21;21(6):543-68.
15. Groff J. Technology-rich innovative learning environments. *OCED CERi Innovative Learning Environment project*. 2013 Feb:1-30.
16. Mondal A, Mete J. ICT in higher education: opportunities and challenges. *Institutions*. 2012 Dec 6;21(60):4.
17. Sanyal BC. *New functions of higher education and ICT to achieve education for all*. International Institute for Educational Planning: UNESCO. Paris, 2001.
18. Bottino RM. *Proceedings of working groups on International federation for information processing*. Australian Computer Society. Darlinghurst, Australia, 2003.
19. Mason R. From distance education to online education. *The Internet and higher education*. 2000 Jan 1;3(1-2):63-74.
20. Kozma RB. Technology and classroom practices: An international study. *Journal of research on technology in education*. 2003 Sep 1;36(1):1-4.
21. Lim CP, Hang D. An activity theory approach to research of ICT integration in Singapore schools. *Computers & Education*. 2003 Aug 1;41(1):49-63.
22. World Bank. *Computers and Education: Report on Education and Development*. WB. Geneva. 2016.
23. Dyrbye L, Cumyn A, Day H, Heflin M. A qualitative study of physicians' experiences with online learning in a masters degree program: Benefits, challenges, and proposed solutions. *Medical teacher*. 2009 Jan 1;31(2):e40-6.
24. Haddad W, Jurich S. ICT for education: Potential and potency. *Technologies for education: Potential, parameters and prospects*. UNESCO and Academy for Educational Development. 2002:28-40.
25. Yusuf MO. Information and Communication Technology and Education: Analysing the Nigerian National Policy for Information Technology. *International education journal*. 2005 Jul;6(3):316-21.
26. Toro U, Joshi MJ. A review of literature on knowledge management using ICT in higher education. *International Journal of Computer Technology and Applications*. 2013 Jan 1;4(1):62.
27. Simpson O. *Student retention in online, open and distance learning*. Routledge; 2003 Dec 16.
28. Leonard J, Guha S. Education at the Crossroads. *Journal of Research on Technology in Education*, 2014; 34(1), 51-57.
29. Zembylas M, Theodorou M, Pavlakis A. The role of emotions in the experience of online learning: Challenges and opportunities. *Educational Media International*. 2008 Jun 1;45(2):107-17.
30. Hashey AI, Stahl S. Making online learning accessible for students with disabilities. *Teaching exceptional children*. 2014 May;46(5):70-8.
31. Chandra S, Patkar V. ICTS: A catalyst for enriching the learning process and library services in India. *The International Information & Library Review*. 2007 Mar 1;39(1):1-1.
32. Sharma P, Gupta A, Rao KV, Owens FJ, Sharma R, Ahuja R, Guillen JO, Johansson B, Gehring GA. Ferromagnetism above room temperature in bulk and transparent thin films of Mn-doped ZnO. *Nature materials*. 2003 Oct;2(10):673.
33. Kremer N. How I became a convert to Online Learning, [www.ascd.org](http://www.ascd.org). 2012.
34. Muuro ME, Wagacha WP, Kihoro J, Oboko R. Students' perceived challenges in an online collaborative learning environment: A case of higher learning institutions in Nairobi, Kenya. *The International Review of Research in Open and Distributed Learning*. 2014 Oct 22;15(6).
35. Ololube NP, Eke P, Uzorka MC, Ekpenyong NS, Nte ND. Instructional technology in higher education: A case of selected universities in the Niger Delta. *InAsia-Pacific Forum on Science Learning & Teaching* 2009 Dec 1 (Vol. 10, No. 2).
36. Sun P, Tsai RJ, Finger G, Chen Y. *Computers and Education*. UDM. Los Angeles, 2007.

37. Roach V, Lemasters L. Satisfaction with online learning: A comparative descriptive study. *Journal of Interactive Online Learning*. 2006;5(3):317-32.
38. Patton MQ. *Qualitative Evaluation and Research Methods*. Newbury Park. UNFPA, 2000.
39. Cohen L, Manion L, Morrison K. *Research methods in education*. New York. Routledge; 2007 Sep 11.
40. Fraenkel JR, Wallen NE. *How to design and evaluate research in education*. New York: McGraw-Hill; 2006.
41. Creswell JW, Hanson WE, Clark Plano VL, Morales A. Qualitative research designs: Selection and implementation. *The counseling psychologist*. 2007 Mar;35(2):236-64.