

THE CAPACITY OF E-LEARNING IN PROMOTING THE DEVELOPMENT OF INFORMATION SCIENCE IN ANAMBRA STATE OF NIGERIA

CHIBUZOR CHIDIOGO MEZUE

*Library and Information Department,
Federal College of Education (Technical), Umunze,
Anambra State, Nigeria*

And

FIDELIS IFEANYI OKEKE

*Computer Science Education Department,
Federal College of Education (Technical), Umunze,
Anambra State, Nigeria*

Abstract

Across all levels, the online evolution of education frameworks has prompted a digital teaching and learning environment, called e-learning, to be implemented. The outbreak of COVID-19 compelled the closure of classrooms around the globe, causing 1.5 billion learners and 63 million teachers to change their normal learning habits unexpectedly. Various countries of the world are in different preparedness levels, and that has declared a state of emergency in the global educational system. This paper explores the concepts and theories of E-learning; evaluates the e-learning policy initiation, implementation and sustainability; assesses the current e-learning capacity in Anambra State and compares it with few other developed cities. The paper will also examine the roles of e-learning in driving and promoting the development of Information Science in Anambra state with synopsis of current development level as regards policy implementation, infrastructure level, trained manpower availability and readiness of learners in embracing e-learning technologies. The author made recommendations based on the findings, which includes, but not limited to: ways of improving existing infrastructure, training and retraining of staff, technology exchange services and strategic policy frameworks for sustainable developments. With sufficient data gathered and analysed, the author then arrived at conclusions.

Key Words: E-learning, Information, Science, Sustainability, Development

Introduction

One of the traits that distinguish human beings from other living things is to provide and receive education. And human beings are constantly developing their teaching/learning resources and strategies for better education. Every change in human civilization has had an influence on education. The advances in computing and information Technology (ICT) has brought psychological, sociological, cognitive development in all human endeavour and especially massive improvements in the area of technology in education (Zhang & Zhou, 2017). ICT 's latest boost has its unique impact on teaching and learning. In educators and learners, conventional and technical education, as well as at all educational levels, this influence of ICT is evident. E-learning is regarded as the most recent influence of ICT in the field of education. There are also other nomenclatures for e-learning, such as computer-aided training, computer-based training, online education, web-based training, and so on (Hinostroza, 2017).

Brief Development of E-learning

Since the increasing interest in using digital network infrastructure to push the educational wheels, e-learning was born and has remained there for some time now. In all subjects, including library and information science (LIS), this has brought new educational opportunities. The emergence of the internet and world wide Web (WWW) has introduced many new possibilities and developments in technology, such as online learning platforms and social media study groups that promote immersive learning, as well as simulated teaching (Journell, 2010). Social media networks have provided learners all over the world with a lot of support. Social networking is expected to be the cornerstone of e-learning, where individuals can have interactive studies online via the utilization of social media channels (Iddriss&Sarraj, 2019). Scholars have explored the influence of social media on various sectors like Staff productivity, customer brand awareness, and e-learning. Online learning can be traced back to the 1990s, when the movement began and expanded. The growth of personal computers was on the rise during this era. E-learning has become more streamlined, making it easier to acquire online skills. With this, e-Learning possibilities started to grow, becoming more acceptable in digital formats. To ease the flow of online learning, multimedia CD-ROMs and PDF text files have come into the picture. As it was financially and socially more advantageous, online lessons became increasingly popular. Some notable accomplishments have been seen this generation, such as personal home computers,

virtual realms, digital instructional courses, and reconfiguring content into digital media (Beaudoin, 2013).

The Imperatives of E-learning Compelled by the COVID-19 Crisis

The coronavirus (covid-19) pandemic has brought changes in the way many tasks are performed. All campus-based (conventional) learning has come to a halt all over the world. The majority of schools have switched to online teaching and learning modes. Since there is a lack of infrastructure that propels e-learning in most developing countries such as Nigeria, schools are forced to follow different modes of e-learning to conclude syllabi and summarize semester they have already begun (Gautam&Gautam, 2020). The immediate need to 'move online' triggered by the recent pandemic has contributed to the pressures and workloads faced by teachers who have already struggled to combine the responsibilities of teaching, study and societal obligations. For the education sector worldwide, the Covid-19 pandemic has posed major challenges. The urgent and unforeseen call for previous face-to-face school courses to be taught online has been a particular challenge. Some pedagogical material awareness (PCK) includes online teaching and learning, primarily related to developing and arranging, with the aid of digital technology, for improved learning outcomes and creating a unique learning atmosphere (Rapanta, Botturi, Goodyear, Guàrdia&Koole, 2020). Teaching staff of all experiences and ages, with all the functional and technological difficulties that this implies, and also without adequate technical support, had to plan and deliver their classes from home. Most fundamentally, the challenges involve pedagogical principles and knowledge of the concepts necessary to create effective digital educational content and the way of delivering them (Houlden&Veletsianos, 2020).

In order to design a paradigm shift model that will address the many different spheres needed to resolve the complex, intersectional Nigerian and global crises that the pandemic has further exposed, institutions such as universities need to engage in creative and innovative research and teaching and learning strategies (Zhang, Wang, Yang & Wang, 2020). If African research voices must come strongly to the fore with context-appropriate tactics and solutions, the strategies must follow a bold thinking and adaptive change. In order to accelerate discoveries, new knowledge and breakthroughs that will promote sustained and uninterrupted educational change, which has already begun to take place in developed countries, all stakeholders in education around the

world need to work together (Espino-Díaz, Fernández-Caminero, Hernandez-Lloret, Gonzalez-Gonzalez & Alvarez-Castillo, 2020).

The Concepts, the Tools and the Objectives of E-learning

According to Anastasiades and Zaranis (2018), e-learning is electronic media-enabled learning. It is a learning opportunity enabled by the introduction of ICT. E-learning is an educational process using software, telecommunications, computer networks, and storage technologies. E-learning is the overarching umbrella of education, information, communication, and training. It is a web-enabled framework that makes information and expertise available to those who need it, anytime, anywhere and however they need it.

The Concepts of E-learning

E-learning has the following characteristics that place it in a more pedagogical context.

Remote Location for Learner/Teacher; In the environment of e-learning, for the purpose of education, the learner and teacher do not need to move to a common physical venue.

Learner Tailored Content: E-learning can be personalized to the learner or, as it is called, customized to the learner's needs.

Course Material: Course material is prepared by the instructor, facilitator or his organization. This includes curriculum, courseware, homework, glossaries, references from sources, quizzes, lecture presentations, questions concerning examinations, etc. The course materials are made available online in digital form (Anastasiades&Zaranis, 2018).

Multimedia Nature: In electronic format, the course content can be in textual, audio or video format or combined by a standard course content.

E-communication: All notes, notices with respect to Admission, request, analysis, results, etc. are made available on websites via the Internet.

Uses the Internet: Internet-based resources such as blogs, chat rooms, peer and expert discussion groups, e-mails, etc, enhance educational instructions interactively. The online courses also include links to valuable online and intranet services (Silverman &Hoyos, 2018).

Anywhere Learning: E-learning offers online access through ICT to learning facilities. As such, the e-learner can learn from the location of his comfort, even when traveling from home, workplace, or practically from anywhere.

Anytime Learning: The time for the e-learner is not limited, you can learn whenever it fits your schedule. It is truly a 24/7 method of learning.

Just-in-Time: E-learning is structured to acquire skills that are needed at the given time.

Multiple collaboration: Multiple interactions, i.e. teacher-student, student-student, and also teacher-teacher, occur in e-learning. Multiple partnerships often include cooperations among professionals in content creation and participants in the field of technology (Hawkins, 2010).

Active involvement of the learner: E-learning is unlikely without the learner's active engagement. The learning target becomes unattained if the student does not adapt to the teacher's interventions.

Facilitates lifelong learning: E-learning, even though, self-paced, can improve learners' competencies which can be useful for continuous learning (Idriss&Sarraj, 2019).

The Tools of E-learning

The e-learning group uses the following methods widely, apart from the Internet, Intranet, and network technologies and methodologies:

Course Management Systems (CMS): In the development and management of course materials such as courseware, tasks, glossaries, citations to other resources, CMS tools and support are extensively deployed. In other words these tools help in total e-learning. Moodle, Slodde, Lectureshare, elementK, Blackboard, AuthorIT, digitalTthink.com, IndiaWebDevelopers and E-learning Solution are some of the course management tools (Mcdaniel, 2019).

Blogs: A blog allows relevant information to be disseminated and viewed. The websites of the library and information science departments have blog services , in addition to blogs dedicated to LIS.

Wikis: Wiki is a piece of software that enables individuals, under an editorial board's management, to upload or change existing content. LITA (Library and Information Technology Association), for instance , provides LIS e-learners with blogs and wikis.

E-mails: E-mails and e-mail-based discussion groups, such as the LIS-forum, are valuable for distributing content and e-learning correspondence.

Messenger: For synchronous communications involving several students, messengers such as Facebook Messenger, Yahoo Messenger or MSN Messenger may be used. For real-time virtual conferencing, facilities like zoom may also be used (Reed, Jones & Reddington, 2017).

The Objectives of E-learning

E-Learning is a massive and expanding higher education network with tremendous prospects.

Since there are many challenges to making eLearning successful, it is important to know that there are certain goals and some of these are:

- Enhance the quality of learning and teaching
- Meet the learning style or needs of students
- Improve the efficiency and effectiveness
- Improve user-accessibility and time flexibility to engage learners in the learning process
- To track learning effectiveness,
- To track students' progress,
- To improve teacher performance
- To support business objectives,
- To reduce the need for physical classroom learning
- To link training with Knowledge management(KM)
- To make learning available anytime, anywhere (Francis, 2018).

E-learning Policy Initiation, Implementation and Sustainability

The advancement of Information and Communication Technologies (ICT) has undeniably brought about transformations in all aspects of society, including education. Traditional teaching and learning approaches have been infiltrated by the Internet and the use of network-connected devices. As a result, numerous educational modalities have emerged, reflecting these developments and generating new scenarios that form the processes of training. E-learning is among the new modalities of online education (Castro & Zermeño, 2020).

E-learning Policy Initiation in Nigeria

Governments in Nigeria launched an ICT policy in 1987. The legislation was titled 'The National Policy on Computer Literacy and Education.' This is geared towards equipping Nigerians with preliminary ICT resources at all levels of education. The National Education Policy (FRN) (2004) stipulates thus:

- In order to provide a forum for the exchange of ideas on the creation and use of creative materials for the advancement of education, a network of educational service centres in Nigeria (NESCO) will be set up.
- All Governments, teachers, resource centres, university education institutes and other professional bodies are members of the ICT network.
- The government shall provide facilities and appropriate infrastructure at all levels for the promotion of ICT educational matters.

UNESCO has stated, in line with the above, that teachers and teacher-educators are of central importance in tapping the potential provided by ICT for improving the standard of education. The UNESCO Guidelines include:

- Understanding the regional teaching and learning guidelines for ICT integration.
- Comprehending the methodological context of ICT-integration competency requirements.
- In the teaching-learning sense, incorporate productivity-enhancing ICT resources.
- Usage of multi-model courseware cum shareware to improve teaching and promote learning.
- Integrating ICT to build higher order thinking skills among earners using pedagogical innovations.

In addition, several instructional methodologies for efficient and effective teacher preparation were proposed in the policy paper:

- Presentation of Interactive theme.
- Community chat and round table assignments.
- Integration of ICT and demonstration of it.
- Exchange of perspectives and
- Hands-on-exercise (UNESCO, 2015).

E-learning Implementation and Sustainability in Nigeria

Due to too many factors, studying in an electronic setting is a great challenge in Nigeria. At this time, Nigeria is unable to afford broad access to all the latest innovations available for education due to many negative economic factors, and to enable modern educational technology and e-learning to be widely deployed in Nigerian schools, these challenges must be mitigated. Some of these negative factors included technical difficulties, access to the Internet, electricity, inadequate skills, poor literacy, and so on. Today, Nigeria's educational sector has experienced a critical lack in teaching materials, an inadequate framework for the development, storage and maintenance of digital learning tools. The staff were not educated in the efficient use of information and communication technology in the educational process (Owede, 2015).

It is evident that the notion of e-learning is considered to be very attractive as a new learning paradigm with a positive impact on the development of education in developing countries, especially Nigeria. With all its potential, not much effort has been made to implement it. Current e-learning research in Nigeria shows that Nigeria still faces a lot of problems in this field with e-learning on the agenda. Many of the challenges are not only technical, but also social, academic, economic and cultural. The COVID-19 pandemic is globally revolutionizing digital and online education, but children are being left behind in rural and underserved communities in Nigeria as they are not equipped to adapt or migrate to modern learning methods. Implementation of e-learning is also weak and unsustainable in Nigeria's Anambra State (World Economic Forum, 2020).

Current E-learning Capacity in Anambra State Compared with Developed Cities

In developing countries like Nigeria where Anambra state is situated, 'e-learning is challenged with the problem of material devices such as computer, computer laboratories, internet and e-mail facilities, videophone systems and teleconferencing devices, fax and wireless applications, digital library, digital classrooms, multimedia systems and the problem of multimedia courseware development among others' (Olutola&Olatoye, 2015). Other studies indicated that there is a dearth of trained teachers for e-learning, lack of facilities, infrastructures and equipment. The findings by the work done by Nwana (2012) revealed 'acute shortage of e-learning materials such as on-line/internet-connected computers, e-mail facilities, multimedia television, multimedia computer and digital library. It was also revealed that the few available ones

such as off-line/ordinary computers, scanner, printer and ready-made courseware are not utilized because the teachers lack the knowledge and skills of computer application. The only material identified as available and in use is the telephone’.

E-learning Capacity in New York and Other Cities in USA

In New York, infrastructure and logistics for e-learning capacity building has been top notch. For example, the ‘Smart School Bond Act (SSBA) provides funding for district technology and community connectivity projects’, and The Community Connectivity category involves partnerships between school districts and communities, which is used to supply Wi-Fi access points or computing devices to public libraries or community centers. ‘The Broadband for All program is awarding \$500 million in grant funding to support projects that deliver high-speed Internet access to Un-served and Underserved areas of the State (New York State Education Department, 2015). The goal of this multi-year program, administered by the New York State Broadband Office, is to provide statewide broadband access’ which has existed since the year 2000.

For the 14th consecutive year, the growth of online enrollments in the U.S. has increased regardless of an expanding or diminishing economy and increasing or decreasing total college enrollments. Around the same time , the number of students on a brick and mortar campus solely taking face-to - face classes has been falling. There were more than 6 million students enrolled in at least one online course in the U.S. in 2016, and the number of students enrolled in at least one online course has grown to more than 30 percent. The highest number of students taking online courses is in state schools and non-profit institutions (Lederman, 2018).

E-learning Capacity in Mumbai and Other Cities in India

As mentioned by KPMG India and Google, developing countries like India are in a better position to ignore the erroneous models adopted earlier in advanced countries like USA and leverage the latest advancements such as hybrid model, addition of new and offbeat subjects, gamification, peer-to-peer learning, and profile mapping (Bansal, 2017). As per the study made by KPMG India and Google (2017), ‘the online education system in India currently stands at US \$247 million with an average of 1.6 million users; it is expected to grow to US \$1.96 billion with around 9.6 million users by 2021’. According to KPMG India and Google, ‘the major drivers for online/blended education

in India include (a) phenomenal growth in Internet2 and smartphone penetration; (b) low cost of online education; (c) digital-friendly government policies; and

(d) escalating demand by working professionals and job-seekers for continuing education'

'Digital India and Skill India' are among the several government initiatives launched to spread digital literacy in India (Palvia, Aeron, Gupta, Mahapatra, Parida, Rosner& Sindhi, 2018).

The Roles of E-learning in Driving the Development of Information Science

In order to reposition themselves for a sustainable future, the potential of information technology has compelled different institutions to go digital. This has also happened with the libraries and information science. With new mechanisms such as computer networks, content portals, e-libraries, distance learning and web enabled classrooms, the roles of teachers and students are changing (Sun & Yuan, 2012).

Implications of E-learning in Library and Information Science

E-learning unlocks a new hope and aspiration in LIS education, services and careers in the present era of the knowledge frontier. Currently, library and information systems are engaged in rapid changes as a consequence of opportunities that e-learning provides; demand for new services; pressure of the paradigm change for sustainable productivity and roles; increased demand for services 24 hours everyday; changing landscape in learning; job-Specific needs; more interactive contents and minimal duration (Sawant, 2015).

New Opportunities Offered by E-learning to LIS

E-learning provides new opportunities for librarians and information professionals in a wide variety of fields to improve their expertise and skills.

Teaching in Library and Information Science: The function of university libraries is being altered by IT. One of the interesting consequences is a much greater emphasis on the strategic planning of the institution, providing more supporting roles in the virtual world and the incorporation of digital resources. It is unlikely that e-learning and teaching can replace face-to - face training and education (Maybee, Bruce, Lupton &Rebmann, 2013), it will quickly become an important additional delivery tool and provide many people with new learning opportunities. E-Learning, both on campus and

distance learning, is used by library and information staff as a way to help students. E-learning provides the ability for information workers in various countries to work together and develop their own professional expertise through virtual networks of practice (Lederman, 2020).

E-Learning in Digital Libraries: Many of our university libraries are now automated and provide e-mail accounts for many scholars. With the aid of web and email attachments, communication and data transfer or sharing has become simple. A digital library system may integrate the idea of e-learning, with the possibility of well-equipped classrooms and user-friendly technology, digital libraries and e-learning have to complement each other. It is also important to develop Internet delivery mode and open archives (Anderson & Rainie, 2020).

Challenges Faced by LIS in Successful Utilization of E-learning

The sustenance of quality LIS education in the changing global scenario of teaching/learning, mostly brought about by COVID-19, faces challenges with regard to the continuation of learning in the event of emergencies like the recent lockdown. Limited Internet connectivity, inadequate computer and communication infrastructure are the key obstacles that make it difficult for institutions in Anambra state to access and download full text, databases and other media resources (Azzi-huckti & Shmis, 2020). Other major challenges of introducing e-learning LIS education are:

- Lack of Finance
- Lack of Knowledge and Training
- Insufficient Contact Classes
- Lack of IT Proficiency
- Inadequate supply of manpower
- Poor roadmaps for skills acquisition and transfer
- Corruption in the high places

Conclusion

E-learning is not a new idea, but has evolved as the worldwide web has grown and spread its roots to the Nigerian educational landscape in every region. Students of library and information science can remain at home and be educated worldwide through the Internet via e-learning. This is the moment for deep thought concerning the new Library and Information Science syllabus. As a developing country like Nigeria, it is

difficult, but not impossible, to design new courses and a new e-learning LIS education system. This task entails many rigorous responsibilities, but the possibilities of stopping conventional schooling, as was the case with the current pandemic, reveals that the importance of creating a new electronic education framework for LIS outweighs the challenges. Anambra state of Nigeria needs to develop e-learning to ensure that quality education is not compromised no matter the circumstances, especially in LIS education, as virtual learning has become vital for continuous and sustainable education in a globalised world.

Recommendations

1. The key priority of librarians should be the updated LIS program that produces high-quality LIS graduates for library services in the global world.
2. As a matter of urgency, the LIS education system in Nigeria should build new skill sets designed to provide and redirect the delivery of library resources in support of learning in a virtual world.
3. Academic libraries in Nigeria should also be granted their pride of position as academic repositories, to be able to follow global best practices in the post COVID-19 era through sufficient funding.
4. Institutions in Anambra state need to combine conventional and virtual classroom learning in their schools; make online education a strategic priority; and reconsider institution-industry collaboration initiatives as seen in developed countries.

References

- Anastasiades, P., &Zaranis, N. (2018). *Research on e-Learning and ICT in Education Technological, Pedagogical and Instructional Perspectives*. Springer International Publishing.
- Anderson, J., &Rainie, L. (2020, August 17). Stories From Experts About the Impact of Digital Life. Retrieved from <https://www.pewresearch.org/internet/2018/07/03/the-positives-of-digital-life/>
- Azzi-huckti, K. &Shmis, G., (2020, March, 18). Managing the impact of COVID-19 on education systems around the world: How countries are preparing, coping, and planning for recovery. Retrieved from <https://blogs.worldbank.org/education/managing-impact-covid-19-education-systems-around-world-how-countries-are-preparing>

- Bansal, S. (2017, July 13). How India's ed-tech sector can grow and the challenges it must overcome. Retrieved from <https://www.vccircle.com/the-present-and-future-of-indias-online-education-industry>
- Beaudoin, M. F. (2013). *Online learner competencies: Knowledge, skills, and attitudes for successful learning in online settings*. IAP, Information Age Publishing.
- Castro, M. P., & Zermelo, M. G. (2020). Challenge Based Learning: Innovative Pedagogy for Sustainability through e-Learning in Higher Education. *Sustainability*, 12(10), 4063. doi:10.3390/su12104063
- Espino-Díaz, L., Fernandez-Caminero, G., Hernandez-Lloret, C., Gonzalez-Gonzalez, H., & Alvarez-Castillo, J. (2020). Analyzing the Impact of COVID-19 on Education Professionals. Toward a Paradigm Shift: ICT and Neuroeducation as a Binomial of Action. *Sustainability*, 12(14), 5646. doi:10.3390/su12145646
- Federal Republic of Nigeria, (FRN), (2004). National Policy on Education. Lagos: NERDC Press
- Francis, K. (2018, September 21). Major Goals And Expectations Of eLearning. Retrieved from <https://elearningindustry.com/goals-and-expectations-of-elearning-major#:~:text=The Major Goals Of eLearning&text=Enhance the quality of learning,learners in the learning process>
- Gautam, D. K., & Gautam, P. K. (2020). Transition to Online Higher Education during COVID-19 Pandemic: Turmoil and Way Forward to Developing Country - Nepal. doi:10.21203/rs.3.rs-59206/v1
- Hawkins, R., (2010, January 11). 10 Global Trends in ICT and Education. Retrieved from <https://blogs.worldbank.org/edutech/10-global-trends-in-ict-and-education>
- Hinostroza, J. E. (2017). New Challenges for ICT in Education Policies in Developing Countries: The Need to Account for the Widespread Use of ICT for Teaching and Learning Outside the School. *ICT-Supported Innovations in Small Countries and Developing Regions*, 99-119. doi:10.1007/978-3-319-67657-9_5
- Houlden, S. & Veletsianos, G., (2020, September 06). Coronavirus pushes universities to switch to online classes - but are they ready? Retrieved from <https://theconversation.com/coronavirus-pushes-universities-to-switch-to-online-classes-but-are-they-ready-132728>
- Iddriss, Z., & Sarraj, A. A. (2019). Exploring Trends in Open Access Repositories: The Case of Higher Education Institutions in Nigeria, Ghana, Cabo Verde, and

Senegal. 2019 ACM/IEEE Joint Conference on Digital Libraries (JCDL). doi:10.1109/jcdl.2019.00073

- Journell, W. (2010). Perceptions of e-learning in secondary education: A viable alternative to classroom instruction or a way to bypass engaged learning? *Educational Media International*,47(1), 69-81. doi:10.1080/09523981003654985
- KPMG & Google. (2017). Online Education in India: 2021. Retrieved from: <https://assets.kpmg.com/content/dam/kpmg/in/pdf/2017/05/Online-Education-in-India-2021.pdf>
- Lederman, D. (2018). Who is studying online (and Where): Inside higher Ed. Retrieved from <https://www.insidehighered.com/digital-learning/article/2018/01/05/new-us-data-show-continued-growth-college-students-studying>
- Lederman, D. (2020, March 18) Inside Higher Education. Retrieved from <https://www.insidehighered.com/digital-learning/article/2020/03/18/most-teaching-going-remote-will-help-or-hurt-online-learning>
- Maybee, C., Bruce, C. S., Lupton, M., &Rebmann, K. (2013). Learning to use information: Informed learning in the undergraduate classroom. *Library & Information Science Research*,35(3), 200-206. doi:10.1016/j.lisr.2013.04.002
- Mcdaniel, R. (2019, November 06). Learning and Course Management Systems (LMS/CMS). Retrieved from <https://cft.vanderbilt.edu/learning-and-course-management-systems/>
- New York State Education Department. (2015, March 31). Home and Community Internet Connectivity. Retrieved from <http://www.nysed.gov/edtech/home-and-community-internet-connectivity>
- Nwana, S. (2012). Challenges In The Applications Of E-Learning By Secondary School Teachers In Anambra State, Nigeria. *African Journal of Teacher Education*,2(1). doi:10.21083/ajote.v2i1.1913
- Olutola, A. T., &Olatoye, O. O. (2015). Challenges of E-Learning Technologies in Nigerian University Education. *Journal of Educational and Social Research*. doi:10.5901/jesr.2015.v5n1p301
- Owede, K. E. (2015). E-learning as a Veritable Tool for Capacity Building in Adult Education and Open Distance Education in Nigeria. *Journal of Educational and Social Research*. doi:10.5901/jesr.2015.v5n1p137

- Palvia, S., Aeron, P., Gupta, P., Mahapatra, D., Parida, R., Rosner, R., & Sindhi, S. (2018). Online Education: Worldwide Status, Challenges, Trends, and Implications. *Journal of Global Information Technology Management*,21(4), 233-241. doi:10.1080/1097198x.2018.1542262
- Rapanta, C., Botturi, L., Goodyear, P., Guàrdia, L., & Koole, M. (2020). Online University Teaching During and After the Covid-19 Crisis: Refocusing Teacher Presence and Learning Activity. *Postdigital Science and Education*,2(3), 923-945. doi:10.1007/s42438-020-00155-y
- Reed, V. M., Jones, T. E., & Reddington, M. (2017, September 29). 10 Powerful E-Learning Tools Trending Right Now. Retrieved from <https://trainingindustry.com/articles/e-learning/10-powerful-e-learning-tools-trending-right-now/>
- Sawant, S. (2015). Open Source and Free E-Learning Tools Useful in LIS Education. *Open Source Technology*, 1437-1445. doi:10.4018/978-1-4666-7230-7.ch071
- Silverman, J., & Hoyos, V. (2018). *Distance Learning, E-Learning and Blended Learning in Mathematics Education International Trends in Research and Development*. Springer International Publishing.
- Sun, J., & Yuan, B. (2012). Development and Characteristics of Digital Library as a Library Branch. *IERI Procedia*,2, 12-17. doi:10.1016/j.ieri.2012.06.044
- UNESCO. (2015). Information and Communication Technology (ICT) in Education in sub-Saharan Africa: A comparative analysis of basic e-readiness in schools. Information Paper No. 25. doi:10.15220/978-92-9189-178-8-en
- World Economic Forum. (2020, June 2). COVID-19 has exposed the education divide in Nigeria. This is how we can close it. Retrieved from <https://www.weforum.org/agenda/2020/06/education-nigeria-covid19-digital-divide/>
- Zhang, A., & Zhou, T. (2017). Future Classroom Design of Teaching from the Perspective of Educational Technology. *2017 International Conference of Educational Innovation through Technology (EITT)*. doi:10.1109/eitt.2017.56
- Zhang, W., Wang, Y., Yang, L., & Wang, C. (2020). Suspending Classes Without Stopping Learning: China's Education Emergency Management Policy in the COVID-19 Outbreak. *Journal of Risk and Financial Management*,13(3), 55. doi:10.3390/jrfm13030055