

## IMPACT OF EMERGING TECHNOLOGIES IN LIBRARY AND INFORMATION SCIENCE EDUCATION IN NIGERIA.

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### Abstract

This study investigated the integration of emerging technologies such as artificial intelligence, machine learning technology, social media, blockchain technology, and gamifications, e.t.c. into Library and Information Science (LIS) education to enhance students' learning experiences, improve students' understanding, application of information retrieval, analysis and organization of information resources. The research adopted content analysis approach in reviewing some related literature in the field of educational technology. Findings of this study revealed that artificial intelligence (AI), machine learning, mobile social media, Augmented Reality, Virtual Reality, blockchain technology, Data Scienc, Open Educational Resources (OERs) and gamifications are some of the emerging technologies in LIS education. The study concluded that the twenty first century LIS education has the necessity of incorporating the emerging technologies in LIS education as well as giving a new, positive face to LIS education globally in order to improve the learning outcomes of LIS students and enhance learning experiences. The study therefore, recommended that there is need to integrate the use of AI, machine learning, augmented reality, virtual reality technologies, blockchain technologies among others, into LIS education. Also, the LIS curriculum in Nigeria should be generally reviewed for the inclusion of educational technologies and digital training skills in line with the expectations of the digital society.

**Keywords:** Emerging Technologies, Academic Library, Information Science, Education.

### Introduction

In recent times, traditional methods of education are phasing out gradually and are becoming digitized through technological innovations. The rapid development of Information Communication and Technologies (ICTs), internet technologies and web-based applications have initiated unparalleled transformation in tertiary institutions all over the world. As a result of this development, it has impacted on how things are done and its influence on teaching and learning thus, becomes increasingly complex and widespread (Nwosu, Odenigbo & Ndubuisioko, 2016 ). Every sector and profession in this 21<sup>st</sup> century is experiencing both social and technological transformation.

Library and Information Science Education as well, is witnessing the tides and waves of these social and technological changes. With the introduction of the emerging technologies such as Virtual and Augmented Reality, there is a change in our method of teaching the LIS students, change in the way we interact with them digitally and receive feedbacks from our students, change in our research pattern and quality of research papers and recency of the publication through artificial intelligence such as ChatGPT, Answer AI, Ask AI, Chatbox AI, BING, e.t.c. Generally speaking, the whole library operations, library services and library routines have been transformed due to the influence of these latest technologies in LIS education.

Today, modern educational technologies and the underlying models and practices have become integral parts of the teaching and learning process, and have showed rapid (innovative) growth within the higher education domain. (Henderson et al, 2021). As a result, many higher education institutions in developed countries such as China, Japan, U. S. A., Australia, Canada, South Africa, e.t.c., engage greatly in digital technologies but Nigerian educational system is yet to reach that stage. These countries who implement the use of educational technologies, do so to support the various teaching and learning process and curriculum. Didactically; existing studies profess “digital technologies to be one of the most enabling tools that teach or yet higher education instruments that can be applied to facilitate the teaching, learning process and improve, transform both the facilities and students’ expectations and engagement.

### **Statement of the Problem**

In recent times, Library and Information Science education has been witnessing a setback in the structure of their curriculum. This has resulted to a low employability level and functionality of LIS graduates and has drastically reduced admission enrolment of LIS students especially, in Nigerian universities. The situation may be due to lack of introduction and adoption of latest technologies in LIS education. The lack of emerging technologies have led LIS

profession not measuring up to standards with other professions in Nigeria, and globally. This situation has also, brought about a lack of reputation and integrity before the global community. Moreover, the situation has culminated to turnover and turnover intentions of some librarians. The LIS students, being connected to the global community desire to practice in similar ways with that of their colleagues elsewhere.

## **Review of Related Literature**

### **Integration of Virtual Reality (VR) and Augmented Reality (AR)**

One of the most recent breakthroughs in the field of LIS education technologically, is the introduction and implementation of Virtual Reality and Augmented Reality technologies. Marki (2019) noted that emerging technologies are being used to create immersive learning experiences for LIS students and that the use of VR and AR can be used to explore virtual libraries and archives and to interact with digital collections in new ways. Although few tertiary institutions in Nigeria such as Bowen, Babcock University and Covenant University have started to introduce artificial intelligence in some of their operations but the truth remains that Nigeria, the giant of Africa, has a far long way to go in terms of usage of these VR and AR in teaching in any profession including the LIS Education.

One of the most recent examples of VR and AR usage in LIS education is the Virtual Library School (VLS) project developed by the University of North Texas. The VLS is a virtual reality platform that gives students opportunity to explore and interact with a stimulated library environment. Augmented Reality is a technology that has the potential to enhance students' learning experiences and engagement in LIS (Huang and Chen, 2020). AR and VR technologies have promising future in LIS education in the developed countries ,but their integration into LIS curricula in Nigeria is yet to find out the AR and VR stage in Nigerian schools. This form of learning in Nigeria links participants to referenced materials instead of live, real time instructions

(Kalpana, 2010). Participants readily access the available resources and information that they require in order to have an easier and successful learning experience.

AR has the potential to replace paper, anywhere. It seals models, posters, printed manuals. A key benefit of AR technology is that it allows students to get involved in the process of developing lesson plans in collaboration with teachers, gets students excited about content, guiding them to ask more questions, seeing and interacting with artifacts, animals and the digital technology have also been reported to positively impact higher education at a wider scale by increasingly providing access to learning, offering of equal learning opportunities for all and promoting life-long learning (Juan et al, 2011, UNESCO, 2014, 2021). Modern day AR is divided into two main categories, image-based (or marker-based) AR and location-based (or maker-based) AR. (Cheng & Tsai, 2013) Marker-based AR is based on the recognition of physical objects via a device's image input and the appropriate placement of virtual content based upon these images (Wojciechowski & Cellary, 2013). Typically, this relies on the recognition of a tag, like a Quick Response Code (QR), in order to position virtual objects in the proper real-world environment. Marker-less AR, require the aid of location tracking system, typically GPS or Wi-fi position, in order to place virtual objects that can interact with physical environment (Koutromanos, et al,2015)

### **Integration of Social Media in LIS Education**

Mobile social media: mobile phones as a complement and facilitator of old digital assistance, from new kinds of communication and interaction and its mobility makes it easier for libraries to serve and communicate with patrons even while in taxi or queue. (Igwela & Nsirim, 2018). Swohah (2015) conducted a study on the awareness and use of social media among library professionals in India. Findings showed that the majority of the LIS professionals were aware of social media but used it for personal purposes. Students using facilities such as mobile

social media – mobile phones, Facebook, Youtube, LinkedIn, My Space, connect with their prospective employers as well as connect with other professional colleagues as well as taking part in virtual conferences, workshops and seminars. A blog, flicker, library thing and WhatsApp messenger, Twitter, Instagram have the potential to reach and teach students and other clients information literacy and digital skills. Youtube, Facebook and Library things etc. have the potentials to train users and educators in LIS digital information skills personally.

The invention, accessibility and invention of social media has provided a platform for information, education and positive transformation of the academic attitudes of students in LIS and other students. The emergence of social media applications have ushered in many changes in all spheres of human endeavors (Bolton et al, 2013). They have changed the way people communicate, work, study, research for information and do business (Ezeala&Igwesi, 2018). As opined by Tella and Adu (2013), social media has become a common communication channel among young people, particularly students in tertiary institutions. Social media creates an express link for LIS students.

### **Integration of Gamifications in LIS Education**

Gamification in education is the process of transforming typical academic components into gaming themes. Gamification is the use of game elements mechanics and design techniques in nongame scenarios to motivate people. It is about taking something that is not a game and applying game mechanics to increase user engagement, happiness and loyalty. Its adoption in LIS education enhances information literacy skills and to encourage students explore new technologies ( Spartz, 2017). Gamification has been defined in several ways by (Deterding Dixon Khaled, and Nacke, 2011) “as the use of game design elements in non-game contexts”. The phenomenon of creating gameful experience“ (Hamari and Koivisto, 2017). Gamification is the strategic attempts to enhance systems, services, organizations, and activities by creating

similar experiences to those experienced when playing games in order to motivate and engage users. This means that the use of gamifications in LIS increases the attention and concentration of learners thereby, improving their learning interests and motivating learners for academic excellence.

### **Integration of Data Science in LIS Education**

Data science is a relatively new field which has gained considerable attention in recent years and being a new field, it requires a wide range of knowledge and skills from different disciplines including Mathematics and Statistics, Computer Science and Information Science (Virkus & Garoufallou, 2019). There are many challenges to providing education on data science in Library and Information Science schools (Hagen, Andrews, Federer, and Benoit, 2019). They further stated that curricula, and models for managing Faculty resources (full-time teaching, buy-out, or specialized faculty) are some initial common challenges. Data is meaningless until it is converted into valuable information. Data Science involves mining large datasets containing structured and unstructured data and identifying hidden patterns to extract actionable insights (Ohri. Ajay, 2022).

There are large data that cannot ordinarily be analyzed but with the use of data science technologies, large data can be analysed and set to develop predictive models that can improve library services. Large data are voluminous enough that traditional data processing software tools are inadequate to process and manage them (Ogbonna, Nwokoma and Alala, 2018). The trio, citing Berardi (2015), enlisted a typical big data systems as comprising machine and sensor data; Image, audio, and video data, social data, internet data, and third party data. Data science has continued to be very relevant in any IT related organization which the library is part of. In this contemporary, where generation and application of information is a critical economic activity. Data Science facilitates organizations such as libraries to leverage social media content

to obtain real-time media content usage patterns. This enables the organizations to create target audience –specific content performance, and recommend on-demand content. This means that students and other researchers who engage in social media through data science can be regulated and monitored coupled with packaging the content for better usage.

### **Integration of Open Educational Resources (OERs) in LIS Education**

Open educational resources are free accessible academic resources used by both students and instructors to enhance research, teaching and learning experiences of students and other researchers. According to Tus Midlands Library (2023), OERS are teaching and learning materials that you may freely use and reuse at no cost, and without needing to ask permissions. Unlike traditional copyrighted resources, OER have been authored or created by an individual or organization that chooses to allow for re-use and adaptation of their work. It further stated that it means one can download a resource and share it with colleagues and students. In other case, one can as well download a resource, edit it in some way, and then re-post it as a remixed work. OER can be used to supplement or replace traditional educational resources. The guides listed some of the examples of OER are textbooks, lecture slides, podcasts, Online courses, videos and quizzes.

OERs make students learning interesting, gets them more engaged and directly improve the quality of their learning experience (Itasanmi, 2020). OER has become an important method of providing access to, and enhancing, the teaching and learning experiences for both lecturers and students (Zaid and Alabi, 2020). Using and creating OER encourages collaboration, so students are able to share knowledge & benefit from the ideas of others. Effective use of OER has the potential to improve the quality and reduces the costs of educational materials (Wiche and Ogunbode, 2021).

## Integration of Blockchain in Library and Information Science Education

The main goal of the application of blockchain technology (BT) in Libraries and information centers is to give all possible users in participating Library Systems/Schools unrestricted access to digital content and print collections while minimizing risk to protect each user's privacy and identification. Block chain can assist in the certification of the authenticity of degrees, diplomas, and other certificates that could be award to any student, be it undergraduate or PGD student of LIS. This assists in the elimination and reduction of fraudulent practices associated with certificate forgery. Thus, ensuring deserved recognition of any student who have graduated and merited a certificate (Singh &Singh, 2019).

Block chain technology can help in tracing the ownership and usage of digital content. This means that block chain technologies plays a critical role in maintaining the copyrights laws without letting infringers to encroach into the right of the original owners of the intellectual properties. Also, secret users of the digital contents can easily be tracked through the use of block chain unlike the traditional practices that do platforms. Block chain technologies can be used for record keeping: the study of block chain technology can be used to maintain a tamper proof record of students' achievements, such as grades and attendance which highly helps in ensuring accuracy and transparency. This can as well be applied in LIS education where all students' grades and attendance can be secured through the use of block chain technology to ensure authentic and transparent scores. Learning has two phases namely: Decentralized learning and Micro-credentialed.

**Decentralized Learning:** The use of block chain technology can enhance collaborative learning among peers. It encourages sharing and exchange of ideas, experience and information devoid of intermediaries. Knowledge, information and experiences are no longer kept confined to an individual but shared to other users for enhancement of learning, research, and teaching.



**Micro-Credentia**lity: LIS education involves learning various skills. Block chain technology can play a part in creating a platform in the system of micro credentials that can be earned for specific skills, allowing students exhibit their potentials broadly.

### Conclusions

The study concludes that the impact of the educational technologies such as AR, VR, Blockchain, Data Science, Artificial Intelligence and Machine Learning as well as social media have been very tremendous in this 21<sup>st</sup> century and beyond. Many academic libraries of the developed countries have already aligned with these technologies but Nigeria especially, and other developing countries are yet to embrace these technologies.

### Recommendations

The study recommends the following:

1. Librarians of all cadres should endeavour to welcome the world of digitization and queue in by developing and acquiring digital skills through training in order to access the exponential digital contents and to make them available to the end users. This is required if they must carry out the roles expected of them from the digital users who are already tired of the physical libraries.
2. Secondly, librarians and other information professional should endeavour to close the gap between Information Technology and library and information professionals especially where IT is seriously lacking.
3. The management of the university libraries and their parent institutions should be intentional in providing the platform for the provision of educational technologies as studied above as well as provide training policy for training the library staff.

4. Librarians and other information professionals should eschew resistance to change as regards to digitization.
5. The right setting for the utilization of the educational technologies should be fully provided through the provision of stable and sustained electricity with a strong internet connectivity as well as the expertise to man and maintain them.

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