
HARNESSING E-LEARNING TECHNOLOGIES FOR SUSTAINABLE DEVELOPMENT OF LIBRARY AND INFORMATION SCIENCE (LIS) EDUCATION IN NIGERIA

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Abstract

The primary target of this paper is to draw attention to electronic learning (e-learning) technologies and the pivotal role these devices can play in teaching and learning of Library and Information Science (LIS) in Nigerian Library Schools. The concept of e-learning was deconstructed with a detailed exposé on different types and models. Thereafter, the various e-learning technologies were identified giving insights into their application to LIS education. This was followed by an explanation of the major benefits accruing from the use of e-learning technologies for instruction and other educational purposes. Specific reference was made to the potential of e-learning technologies to improve academic performance, sustain students' interest, enhance lecturers' performance and encourage participation in LIS education. Considering the observed sporadic use of e-learning technologies in higher education in Nigeria, suggestions were made on how to integrate and exploit these technologies for effective teaching and study of LIS in the country. In the midst of the advantages in the use of e-learning technologies for LIS education lies an assortment of challenges. Foremost of these impeding factors are: high cost of procurement, wear and tear (incessant breakdown), and epileptic power supply. Several recommendations were made to overcome these problems, including: capacity building, curriculum review and infrastructural upgrade.

Key Words: e-Learning, e-Learning technologies, LIS curriculum, LIS education - Nigeria.

Introduction

The growth, popularity and prestige of a discipline are, majorly, dependent on the strategies adopted to retool its members and educate would-be practitioners. This claim is as true of Library and Information Science (LIS) as it is of other disciplines. LIS is that area of study concerned with mastering the generation, recording, organization, preservation, management and dissemination of information in libraries and allied bibliographic agencies. As the foremost of the information professions, LIS practitioners superintend most professional activities in the various aspects of the information cycle. Hence, in addition to librarianship where they play pivotal role, their expertise have helped to shape the other sub-fields of the information profession, especially, broadcasting, journalism, archives/records management, book trade, printing/publishing, museum administration, courier/postal services and information and communication technology (ICT). The extensive scope of the LIS discipline is, clearly, reflective of the pervasive nature of information as "there is hardly any endeavour in which it (i.e. information) is not an important component" (Aina, 2004, p. 1). It is for this reason that the training of LIS professionals usually adopts the multi-disciplinary approach.

Learning methods and materials in LIS have been in a state of constant evolution. Each generation of LIS educators and practitioners not only devices learning media that suits it, but develops or adapts technologies to smoothen the learning process. As a result, old stereotypes are dropped as new models take the centre-stage. For instance, the 'talk-and-chalk' method - which reigned at the early stages of library education - is no more in vogue. In the same vein, the teacher-centered approach in which the LIS lecturer operated as the encyclopaedia and oracle dishing out knowledge to students/pupils who are seen, largely, as *tabula rasa* has also become a thing of the past. This is because, the emphasis is now on the LIS student who is encouraged to participate actively in the teaching-learning engagement. Their active participation is enhanced by an assortment of technologies which have made learning simple, participatory and enjoyable. It is the marriage of technological adaptation for teaching-and-learning and learner-centred approach that has given momentum and acceptance to the concept of e-learning.

e-Learning is actually a short-form for 'electronic learning'. It gained currency and acceptance within the educational sector in the mid-1990s and can, generally, be defined as the use of computer networks and Internet technologies to deliver information, instructions and education to individuals and groups. This resonates with the description of e-learning as any form of education that is facilitated by the Internet and its technologies, and encompasses the use of the World Wide Web (www) to support instruction and delivery of course contents (Masrom, 2007). Many other scholars agree with this opinion (Kelly & Baur, 2004; Engelbrecht, 2005; Abbad & Morris, 2009; Tagoe, 2012, etc). This concurrence amongst researchers in this area of specialization clearly underlines the fact that e-learning represents any instruction and/or learning that is electronically-enabled. It makes learning practical, participatory, experiential and multi-tasking. In e-learning, students of LIS use appropriate technologies to teach themselves. Additionally, the barrier of location is minimized as students of LIS receive lectures at home, in transit, classroom or offices without any physical contact with the teacher/instructor/lecturer.

The Western countries and most of their outposts in Asia and Far East, have identified and appropriated various e-learning technologies to boost the teaching of LIS. However, the opposite is the case in the under-developed nations of the Third World. Hence, notwithstanding its importance in the present age, the phenomenon of e-learning has not been accorded the desired attention in the Nigerian Library Schools and their various parent

institutions in the country's tertiary educational sector. It is, more often than not, given haphazard attention, especially, by LIS professional associations, regulatory bodies, educational planners and policy-makers who have failed, so far, to come up with a comprehensive, implementable and binding policy-document on it. The ripple effect is that in Nigerian tertiary institutions where the core of the nation's bureaucrats and intelligentsias in LIS are trained, adequate attention has not been paid to e-learning as a mode of instruction. The consequence is the present deficiency in density of e-learning technologies, as well as the limited use of these technologies for purely academic purposes. This state of affair has led to the under-utilization of e-learning technologies to enhance teaching and learning in majority of the Library Schools in the country. A situation of persistent shortage of e-learning technologies and poor utilization of available ones cannot encourage sustainable development of LIS education in Nigeria.

Typologies of e-Learning

Different types or modes of e-learning have been practiced across various educational institutions. The distinction between the various e-learning types depends, largely, on the extent or sophistication of technology employed. Hence, the exact types/modes of e-learning have elicited a multiplicity of debates in line with the interpretations of various scholars. However, many pundits agree with Anastasiades and Retalis (2001) that the three distinctive modes of e-learning are fully-online learning, web-assisted learning and mixed mode learning. This classification of e-learning is popular amongst scholars and researchers as it clearly captures the major avenues through which e-learning is implemented in institutions of learning.

The *fully-online learning mode* has been described as the situation where learning materials, assignments, teaching and learning are all done online (Young, Hausler & Saunder, 2008). It is obvious from this definition that a fully-online learning is that in which the teaching (instructional) and learning exercises are transacted wholly on the Internet. This type of learning makes for no physical contact between the learner (student) and the instructor (teacher or lecturer). This absence of contact is possible due to the fact that every aspect of the teaching-learning engagement is facilitated through the Internet and its accessories. Furthermore, quite unlike the face-to-face mode which is mostly teacher-driven as instructors teach on the subject area of their expertise, in fully-online type, learning is student-centered and amenable to their interest, schedules and habits. Nevertheless, the fully-online method is asynchronous in nature and does not permit live interaction. There is the additional issue of cost implications of installing the basic infrastructure needed to drive the process. These are, perhaps, the major drawbacks of fully-online learning, especially, in a technologically challenged society like Nigeria. Although LIS education is directed towards producing specialized expertise to administer various bibliographic and information agencies, its execution is amenable to fully-online learning which aims at satisfying the needs, interests, learning styles, abilities and aspirations of learners. This is because, this learning mode is self-directed and flexible in nature (Buzzetto-More, 2013).

Another type of e-learning is the *web-assisted mode*. As the name suggests, it is the type of learning that is website-enabled. In other words, in web-assisted learning, course websites and synchronous tools are employed to enhance teaching and learning activities. The use of synchronous tools makes possible live lectures and real-time interactions between learners and instructors. This makes the web-assisted method very interactive and much similar to the classroom instruction. The only difference is that the interactions in web-assisted learning is not physical but are done online (Buzzetto-More, 2013). The web-assisted

mode of learning shares some things in common with the fully-online system as both are technology-driven. The difference between them, however, lies in the fact that, unlike the fully-online type, the web-assisted system includes online discussions and interactions between the learners and their instructors. There is no doubt that the web-assisted mode has some attributes that would enhance the delivery of LIS education in various educational institutions in Nigeria and elsewhere.

The last type of e-learning as identified and popularized by Anastasiades and Retalis (2001) is called the *hybrid mode*. This is that type of learning whereby some aspects of teaching and learning are transacted online, while the rest of the interactions are done face-to-face. It is for this reason that Allen and Seaman (2003) described it as the method of learning that combines face-to-face meeting and interaction with online learning. The hybrid learning method can be fashioned such that, teaching and examination can be done face-to-face in regular classrooms while continuous assessment (tests, assignments, practicum, seminar presentations, etc) are done online. Any other combination or pattern can also be adopted depending on preference, convenience and available equipment. It is that element of physical or personal contact that gives hybrid mode an edge over other types of e-learning. However, the combination of physical contact and adept use of technology yields the best result as it makes learning real, participatory and experiential. The compounding or mixture of methods has led to the use of such terms as blended learning and mixed mode to represent the hybrid mode. Hybrid learning has a place in LIS education as presently executed. Not only that it augments face-to-face instructions in LIS schools, it exposes the students to information resources, online searching skills and stimulus variations.

Irrespective of the types, the common denominator to all types of e-learning remains the fact that they use the Internet and allied technologies to facilitate teaching and learning, with limited or no teacher mediation. It needs stressing that each type of e-learning has its advantages and, of course, criticisms. This is to be expected as nothing is either entirely good or completely bad. Comparatively, however, the hybrid (blended or mixed mode) appears the most suitable of the three e-learning options for LIS education in Nigeria. The reasons are not far-fetched. For the most part, its combination of elements of fully-online learning and web-assisted learning within the conventional classroom makes it easily replicable in various Library Schools in the country. This is because, most of the available tertiary educational institutions have the basic infrastructure to implement skeletal aspects of the hybrid e-learning mode. Besides, this learning mode permits students of LIS to access and read course materials ahead of class instructions directed by the course lecturer. Such prior access to study materials prepares and conditions the minds of the students as they already have a fair idea of the topic to be discussed in class (Smart & Cappel as cited in Nwosu, Odenigbo & Ndubuisi-Okoh, 2016). There is no doubt that the LIS student who has such advance knowledge of the lecture topic would be ready to participate actively - rather than being a passive onlooker - in the teaching and learning engagement.

Sample e-Learning Technologies for LIS Education

The various types of e-learning described in the preceding section are powered by electro-mechanical devices of various sizes and sophistication. These devices represent the e-learning technologies. By simple definition, e-learning technologies are the various telecommunication equipment used to facilitate any teaching and learning engagement. The kinds of e-learning technology employed are largely, a function of level of funding for educational institutions, as well as the state of technological permeation and usage in the wider society. Equally important to sustainable development of LIS education is the ICT

competence of teachers/instructors and students/learners. It needs not be stressed too strongly that a combination of these factors play a significant role in the extent to which technologies of various complexity mediate LIS education in any society. These e-learning technologies of varying specifications need to be harnessed for sustainable development of LIS education in Nigeria. Overall, the gamut of telecommunications technologies that enhance the teaching and learning of LIS can easily be divided into two, namely: synchronous and asynchronous technologies.

Synchronous Technologies: The word 'synchronous' literally means 'happening at the same time' (*Oxford Advanced Learner's Dictionary*, 2010). As such, synchronous learning is that which takes place real-time with an instructor facilitating live discussions and lectures with students in the teaching-learning process. This claim is buttressed by Kalpana (2010) who clarified that participants in synchronous learning mode log in at a set time and interact directly with both the instructor and other class participants. Furthermore, it is a form of learning mediated by certain electronic technologies with the capability to engage people scattered in different places at the same time. This is in line with the dictionary meaning of 'asynchronous' as 'happening at the same time'. Synchronous technologies are, therefore, the set of specialized electronic devices that facilitate real-time instruction and learning, irrespective of time or location. Hence, with synchronous technologies, LIS students can 'attend' classes from anywhere as long as they have the basic electronic communication technologies. The most commonly-cited impediment experienced in synchronous learning bothers on the fact that it requires same-time participation; hence different time zones and conflicting schedules can create communication and presentational challenges (Obasa, 2010). This challenge of time differences, as associated with synchronous learning in LIS education can be overcome if lecturers and students familiarize themselves with time zone differences. Such knowledge and understanding of time differences would enable participants plan the classes, meet datelines and 'attend' lectures. The major ways through which synchronous technologies enrich the learning experience of LIS students include the following (McGreal & Elliot, 2004):

Audio Conferencing: In this form of synchronous learning, real time discussions take place among participants in LIS classes and between these participants and their lecturers or resource persons. It provides opportunities for students to ask questions and obtain answers or clarifications from the course facilitators. Since participation is live, the money that could have been spent on telephone or video calls is saved by the students.

Instant Messaging: An instant message (IM) is simply defined as a short message sent electronically from one electronic device (computer, telephone, etc) to another. Asynchronous technologies allow instantaneous messages (facts, information, instructions, etc) to be delivered as contact is made between participants and instructors.

Chatting: This is the process of exchanging information and messages with other people on the Internet. Such communication usually takes place in a chat room where the discussion is usually on a particular topic of interest to the participants. Chatting is as much a means of communication as it serves as an avenue for teaching and learning. It can enable LIS students ask questions and receive real time answers during LIS classes. This information sharing amongst students can be in textual and graphics formats.

Video Conferencing: As the name depicts, it is a conference mediated by video technology. The technology makes it possible for people separated by distance take part in a meeting in which they are physically absent. In terms of facilitating learning, video

conferencing just as the conventional classroom, enables real time interaction between instructors (lecturers, course facilitators, resource persons, etc) and participants (students, learners, apprentices, counselees, etc). Through video conferencing, students undergoing any of the educational programmes in LIS can join live lecture sessions just as is the case with conventional classrooms.

Web Conferencing: Literally, it is a conference held on the web (i.e. the WWW or World Wide Web). In web conferencing, people in different geographical locations participate in meetings by using web technologies like computers, telephones, video, web-cam or Internet to communicate while the discussion lasts. Web conferencing facilitates learning in that it permits instantaneous sharing of information, documents and application demonstrations.

Electronic White Boarding: This is the process in which teachers, instructors, course facilitators, etc. writewith special pens on a large, smooth-surfaced electronic white board. With the aid of a mouse or an electronic stylus, an instructor can define concepts, explain ideas and illustrate theories through words and diagrams. White boarding therefore mimics the process of writing or drawing on a blackboard as done in a conventional classroom setting.

Application Sharing: Application sharing enables students or conferees to work together on a document at the same time and from different locations. This mitigates, to a considerable extent, the barriers and other inconveniences posed by distance. As a result, students are now presented a platform to work in groups on assignment and presentations.

Asynchronous Technologies: The major distinction between synchronous and asynchronous learning lies in the fact that the later does not take place in 'classrooms'. Rather, Kalpana (2010) described asynchronous learning asa form of learning that links participants to referenced materials instead of live, real-time instructions. This approach to learning would benefit and deepen LIS education in Nigeria bearing in mind its assorted benefits. For the most part, the flexibility of asynchronous learning style gives participants a variety of options, allowing them to learn at their own pace and in their own time (Kocur&Kosc, 2009). It can be inferred from the foregoing explanation that asynchronous technologies are those that connect learners to sources of relevant study materials. This contrasts with synchronous technologies which links students to real-live lecture sessions in conventional 'classrooms'. The most striking feature of asynchronous learning in LIS education therefore rests in the fact that it provides participants access to available information resources for easier, richer and successful learning experience. Some of the technologies that enhance asynchronous learning identified by McGreal and Elliot as cited in Obasa, Eludire and Ajao (2013) are summarized as follows:

*Database:*A databases is an organized set of data stored in a computer or other electronic devices and which can be accessed and used in various ways.It provides access to readily available electronic information resources from which students can select and retrieve information for reference, research and study. As a repository of teaching and learning resources, the database becomes a vital technology in various disciplines, including LIS.

Electronic Book: This refers to a textbook, periodical, memo/circular or any other written document that is available in electronic format. These documents (which are also known as e-books) can only be read on computers, phones and other advanced electronic devices. Electronic books and other e-documents support teaching and learning at various levels. Pupils, students and course participants can download and readthese documents

offline. This, at once, enriches their learning experience and saves learners/students the stress and expenses of searching for the physical copy.

Electronic Library: The electronic library (often called e-library) is a library that exists in electronic form whereby users can access the content without handling the documents physically (Nwokocha, 2017). Some of the devices used to access and retrieve information in the electronic library include: computers, online catalogues, the Internet, websites and CD-ROM databases. The e-library enables students to track and use information materials beyond their immediate physical environment, as well as keep abreast of current trends as captured in publications available in electronic databases.

Online Fora/Forums: These are groups where meetings hold online. Participation in these gatherings requires registration and such participation is only virtual as there is no physical attendance. Rather, members of the forum use specialized electronic technologies (like phones or computers) to connect to the meeting and participate in the discussions by texting their comments and receiving reactions/responses. Online Forums facilitate education as students share problems and get feedback to enquiries or questions. In addition, students receive valuable clarifications and other assistance from fellow students and instructors. Some lecturers even post their assignment on a dedicated class forum.

Mailing Lists: These are online applications that host groups of users with common interests. Each user joins the list of preference by providing an active user address. The technology is designed such that any information posted to the list automatically becomes available to all subscribed users. Messages (information or comments) sent to the list usually engender discussion amongst members. The exchanges/interactions arising from the posts usually add to the knowledge and understanding of the participants and other members of the mailing lists. This is particularly true if the topics or subjects posted have direct relevance to members' disciplines or courses of study.

Electronic Mail: An electronic mail or e-mail is a message or mail sent electronically. Sending an electronic mail (e-mail), therefore, refers to the art or practice of sending messages or data to other people by means of computers connected together in a network. Exchange of e-mails can enhance education as both sender and receiver has the opportunity to share course materials. It also provides participants the avenue for group discussion of topics of mutual interest, as well as contact and interaction with lecturers and other course facilitators. Some lecturers are known to post individualized assignment to their students' emails and these students are required to post their answers/responses on a dedicated email account created for this purpose.

Audio Streaming: This is the continuous play and replay of recorded or live discussions and other audio presentations, especially, radio programmes. Those who were unable to listen to the live broadcast are afforded a second chance to benefit by accessing the audio stream. Audio streaming has diverse educational relevance as it takes the form of pre-recorded lectures, interviews with experts or sound bites that are relevant to what is being studied.

Video Streaming: Just like audio streaming, video streaming involves the showing of motion pictures and images of pre-recorded content that are relevant to the course of study. If the correct permissions are in place, videos can be downloaded and played several times. This is of immense benefit to the student because it reinforces classroom lectures until the student gains full understanding of the topic.

Blogs: Another name for this is web logs. Blogs or web logs enable the dissemination of ideas and comments. Blogs are mostly used in the same way as a notice board. Blogs, as communication tools, are also applicable to education. In that case, they are used as devices to pass information, tasks/assignments and announcements to students.

Web Links: This is another communication technology that enhances teaching and learning by directing users to additional educational and information resources on external web pages. Here, instead of documents being posted in the manner of e-books, video streaming or audio streaming, the students are rather directed to other useful links in order that they might access and download additional documents located there.

The Benefits of e-Learning Technologies in LIS Education

Popular wisdom has it that things exist for some reasons. This conventional knowledge provides the basis for appreciating the application of e-learning technologies in the teaching and learning of LIS. Most things are in existence because of their importance and overall contribution to the growth of the society. It, therefore, stands to reason that several e-learning technologies have been integrated into LIS education in consideration of some benefits accruable to the core stakeholders, to wit: the institution, students, lecturers and the general public. These advantages or benefits are varied depending on the perspective of the assessor. The following will suffice:

Improvement of Academic Performance: Application of e-learning technologies in the teaching and study of LIS boosts the overall academic performance of students. This is because, the students are not confined to classroom instruction as a means or source of information about various topics and courses in the discipline. Rather, they use available learning tools-cum-technologies to widen their knowledge and understanding of the LIS discipline beyond what is taught during conventional lectures. Besides, students can now consult their course materials at their convenience. Educational technologies also assist them to learn at their pace which makes them more interested and devoted to their studies. These technologies also make learning participatory and experiential. Such participation enhances retention of knowledge and expression of same during tests and examinations. This point and its clarification is in line with the observation of Abidoye and Omotunde (2015) that the use of ICTs like CD-ROM in teaching and learning lead to a general improvement in students' academic performance.

Sustenance of Student' Interest: Studies have pointed to the fact that some students find classroom instruction and reading uninspiring (Falade, 2006). This is the result of the student being expected to put up appearance and read extensive textual materials. The big size of some of these books (like dictionaries or encyclopaedias) may be a source of discouragement. Besides, some people generally detest reading (Nnadozie & Egwim, 2010) and this could constitute an obstacle to their academic success. The invention of e-learning technologies has provided a way out for this category of students of LIS. This is because the use of technologies in teaching and learning of LIS removes the monotony and boredom associated with these academic activities. ICTs and other e-learning technologies also elicit and sustain interest in the study of LIS as they promote interaction amongst students, enhance motivation and increase participation in classroom activities (Ajelabi, 2002).

Enhancement of Lecturers' Performance: Technologies have had a most profound influence in every facet of human activity. As a result, the series of technologies designed or adapted to support learning (i.e. e-learning technologies) has impacted positively on the discharge of the responsibilities of the LIS lecturer. Where appropriate e-learning

technologies are in place, LIS lecturers can employ specific tools to deliver their lectures from anywhere without necessarily having to be physically present in classrooms. Furthermore, these technologies help lecturers to handle or co-ordinate large classes as assignments could be individualized, administered and assessed (marked/graded) through email or other online technologies. Copying of other students' assignments, plagiarism and other unethical practices of students are also easier to detect with technologies, especially, plagiarism-detection softwares. Additionally, course lecturers can also use appropriate technologies to process and publish students' results thereby save time and labour, reduce mistakes in manual computation of results and eliminate mutilation and defacement of information published on notice boards. There is no doubt that technologies have severally improved the performance of teachers of LIS.

Increase in Use of Learning Technologies: The use of technologies for teaching and learning has been on the increase in recent times. Many teachers (instructors, lecturers, course facilitators, etc.) use specific technologies to modify the contents of their lecture notes/materials. Many of these learning devices have features which enable the user to write, record, process data, download/upload, store, retrieve, disseminate and preserve information. Lecturers of LIS deliver lectures and achieve other instructional objectives in a more meaningful way, using different multi-media elements. These media elements can be converted into digital form, modified and customized for the final presentation. By incorporating digital media elements into the teaching-learning process, the students are able to learn better since they use multiple sensory modalities, which would make them more motivated to pay more attention to the information presented and retain the information better (UNESCO, 2002; Baran, 2014).

Make Learning More Flexible: The stereotype of the teacher/lecturer as an encyclopaedia and only source of knowledge no longer holds. The emergence of various e-learning technologies has equally demystified and broken the monopoly of the classroom as the only theatre where teaching and learning can take place. Consequently, learning is now more flexible as it can be conducted in any environment with an adept use of relevant technologies. This is as true in LIS education as it is in other disciplines. For instance, through teleconferencing, video streaming, television/radio stations, telephones, satellites and allied technological capabilities, students and lecturers separated by wide distances can link-up to study or discuss any topic of interest in LIS. Hence, the era of regimented or fixed classroom lectures and mandatory attendance is gradually easing away. Students now have the liberty of structuring their lecture periods to suit their other programmes - be it paid employment, business or social engagements.

Enhance Presentation: Various studies have shown that ICT-based instructional strategies like Computer Assisted Instruction (CAI), Game-Based Strategy, Video-Based Strategy, CD-ROM and Power-Point make teaching and learning easier, participatory and experiential (Abimbola & Ogar, 2006 and Abidoye & Omotunde, 2015). These e-learning technologies can be used by LIS teachers to present their lectures in a more meaningful way through graphic illustration of issues and points, using different media elements. In so doing, the pedagogical skills of lecturers of LIS are improved. For students of LIS, on the other hand, these technological devices enhance interactions amongst them and are handy for power-point presentation of their seminars, theses and dissertations. These media elements can be converted into digital form, modified and customized for the final presentation.

Saves Time and Reduces Human Labour: This is another noticeable benefit of the use of e-learning technologies in research and study of LIS. Teaching and learning of topics like

cataloguing, classification, indexing, ICT, electronic publishing, etc without the mediation of technologies is time consuming in terms of planning, preparation and delivery. It is also labour-intensive as a lot of energy is invested in the preparation and delivery of lectures, classroom attendance, preparation of assignments, practical sessions, etc. These challenges have been considerably mitigated through the introduction of various e-learning technologies. Lectures are not only delivered and received real time across different periods and geographical spaces, the amount of human labour involved has been reduced to the barest minimum. Besides, with appropriate technologies, large number of people can participate in a lecture simultaneously without the lecturer dissipating any extra energy nor wasting of time.

Flexibility of Learning: It is necessary to highlight this factor amongst the benefits accruing from application of e-learning technologies for educational purposes. These multimedia devices help the teacher to modify and enrich the contents of teaching material. These media elements can be converted into digital form, modified and customized for the final presentation. As such, the LIS lecturer adapts different media elements to package and present the lecture in a more meaningful way, with particular attention to the individuality of each student. By incorporating digital media elements into lectures and other class projects, the students are guided to learn better since they use multiple sensory modalities. This flexible and individualized approach of the LIS lecturer make the students motivated to pay more attention to what is being taught. The result is usually better understanding of lessons and retention of information by LIS students.

Strategies for Integrating e-Learning Technologies into LIS Education

There is no doubt that products of science and technology have improved and expanded the scope of education in the society. This much is evident in the advanced countries of the world where various electronic and mechanical devices have been appropriated to facilitate the teaching and learning processes across various levels of education. Unfortunately, the under-developed countries have been slow in integrating e-learning technologies in the mainstream of their curriculum planning and educational development. The *raison d'être* for this include: weak financial base, low level of technology penetration, weak institutional framework and shortage of competent manpower. This state of affair has adversely affected the quality of teaching and learning in the backward communities as many are denied alternative means of acquiring education. Hence, the need for concerted efforts to make the use of e-learning technologies a central part of LIS education in the developing countries. There is no doubt that sustainable development of LIS education in Nigeria can only be guaranteed when various technologies are made the focal point of the teaching and learning of the discipline. Some of the strategies for integrating e-learning technologies in teaching and learning with specific reference to LIS are summarized in the ensuing paragraphs:

Overhaul of LIS Curriculum: The first practical step towards integration of e-learning technologies into LIS education is curriculum re-examination. Such careful re-study would reveal the inadequacies or shortcomings of the LIS curriculum presently in use in various Library Schools in the country. For instance, there is need to align LIS programmes offered in Nigeria with global best practices. This calls for a comprehensive overhaul of the course content at all levels of the programme. Consequently, courses that are no more contemporaneous should be removed to make way for the injection of ICT-based topics. The periodic review of the LIS programme provides policy-makers, regulators, practitioners and other specialists in the field the opportunity to inject new ideas and current trends into the academic curriculum. For instance, the regulatory bodies for LIS education in the country,

especially the Librarians' Registration Council of Nigeria (LRCN) and National Universities Commission (NUC) can jointly formulate a policy mandating lecturers to circulate their lecture notes and deliver lectures on selected topics online; some assignments should be submitted, graded/assessed and results published/accessed online. Students can also be instructed to visit some websites and download particular documents (textbooks and other course materials). These are very practical way of institutionalizing the use of e-learning technologies by LIS lecturers and students, respectively. Relevant authorities are, therefore, provided the ample practical opportunity through curriculum review to entrench the use of technologies in the teaching and learning activities of the nation's Library Schools.

Review of Pedagogical Skills/Teaching Methodology: The business of teaching and learning is more effective when the teacher is adept at manipulating the basic pedagogical skills. These pedagogical skills, are the sets of techniques employed in a planned instructional process to bring about effective teaching and learning. They include: set induction, stimulus variation, reinforcement, use of examples and illustrations, closure, planned repetition, non-verbal cues and questioning (Nnadozie, 2008). Other constituents of pedagogical skills are instructional media presentation, classroom organization, chalk/white board management, reward and punishment skills. Considering the centrality of these skills irrespective of the level of education, it becomes necessary to review their implementation in the teaching of LIS. This review may recommend the integration of various e-learning technologies in the use of these pedagogical skills by the teacher/lecturer. Furthermore, the competence expected of LIS lecturers should include ICT literacy which will make it easier for them to employ available educational technologies to facilitate the delivery of course contents to students irrespective of their location.

Reorientation: It is not always easy for people to change the way they do things. A change of attitude or procedure is easier when critical stakeholders are systematically exposed to new innovations through sustained awareness programmes. This is where orientation of these stakeholders becomes central to the incorporation of technologies into the teaching and learning of LIS. The attention of lecturers and students of LIS should be constantly drawn to the potentials of e-learning technologies and how to manipulate these devices to improve the teaching and study of different topics and courses in the discipline. This implies that every opportunity that presents itself should be utilized to sensitize the LIS community about the benefits inherent in the use of e-technologies for various purposes.

Introduction of e-Learning Practicum: Deliberate efforts should be made to include practical e-learning sessions in the teaching of LIS courses. This should actually be at the core of the curriculum innovation earlier suggested. When practical e-learning sessions become part of the mode of study in LIS, the students and their lecturers would realize the importance of these learning aids and make better use of them in their academic quests. Through regular usage and other practical sessions, all parties involved in LIS education would become conversant with various technologies that aid teaching and learning. This will dispel any subsisting techno-phobia as those involved would learn to see these technologies as innovative tools/devices to boost their research and scholarly activities indifferent aspects of LIS.

Provision of Subsidies: One major challenge to the introduction and utilization of e-learning technologies in LIS education in Nigeria is the high cost of procurement, installation and maintenance of these technologies. Whilst most of these Library Schools are grossly under-funded, a good number of the lecturers are poorly remunerated. Majority of students in LIS Schools in Nigeria, on the other hand, come from economically-disadvantaged

backgrounds. The scenario painted above affects the density of e-learning technologies in the country as those expected to use them lack the financial wherewithal to acquire, install and service these technologies. As a result, there is a paucity of e-learning technologies which is a direct result of the harsh economic realities and the attendant high cost of these facilities. In this situation, it becomes practically impossible to implement mandatory e-learning mode in LIS education. This can, however, be ameliorated to a considerable extent via a direct governmental intervention through subsidized importation and distribution of e-learning technologies. A policy of subsidized e-learning technologies will reduce the high cost of these learning technologies and make them cheaper and easier for Library Schools, their lecturers and students to acquire and use in their teaching and learning engagements.

Installation of Basic Infrastructure: e-Learning cannot operate independently because it is a mediated process. The medium is, essentially, the Internet and its associated technologies. Hence, successful implementation of the e-learning mode in Nigerian Library Schools requires massive acquisition and installation of basic infrastructure. These infrastructural facilities cut across telecommunications equipment, electricity, bandwidth and Internet connectivity, to mention but a few. Procurement and maintenance of these infrastructural facilities are both complicated and capital-intensive. This makes the venture beyond the reach of the already cash-starved Library Schools. This makes it imperative for there to be a clear-cut funding strategy. For instance, a definite percentage of each institution's capital budget can be set aside for installation of e-learning technologies. With such institutionalized formula in place, it becomes easier for the authorities of Library Schools in the country to draw from that fund to finance their migration to the e-learning mode.

Some Abounding Challenges

There is no gainsaying that there are several advantages arising from implementation of e-learning and other technology-aided education. The examples cited earlier in this paper, therefore, provide ample justification for the adoption of the e-learning mode in LIS Schools in Nigeria. However, the full appropriation of the benefits of e-learning in these Library Schools is undermined by a catalogue of problems. These challenges range from funding, personnel, policy, psychological and infrastructural. Understandably, sustainable development of LIS education in Nigeria would be hampered as long as these existential problems subsist. The ensuing paragraphs, therefore, provide insights into specific constraints to the adoption and implementation of e-learning in various LIS Schools in the country.

Inadequate Funding of Education: This is, perhaps, the biggest constraint to the implementation of the e-learning mode in LIS education. It is not difficult to appreciate the nature of this problem. A number of authorities have drawn attention to the general underfunding of education at all levels in the country (Akuezilo & Egwuatu, 2002). This unfortunate situation has adversely affected the smooth running of universities and other institutions of learning at the tertiary level of education. The implication is that Library Schools, which draws their financial sustenance from their parent institutions, are left with little or no funds to conduct researches, update curriculum, procure infrastructure, train staff and repair broken-down equipment. The bottom line, therefore, is that majority of LIS departments in the country are also unable to acquire, install and maintain the basic infrastructure for e-learning. The total absence or insufficient provision of various e-learning technologies is a direct aftermath of the inadequate funding of universities and their academic departments, including LIS.

Preponderance of ICT-skill Deficient Lecturers: The ICT-skill deficiency of majority of LIS lecturers in the nation's Library Schools is another factor that impedes the implementation of e-learning in LIS education. The literature is replete with references to the low level computer literacy amongst Nigerians (Okiy, 2005; Elisha, 2006 and Ridwan, 2015). While most of these lecturers did not pass through these ICT courses during their studentship, others have not thought it necessary to enroll for any training in computer or ICT manipulation. Hence, there is ICT-skill deficiency amongst LIS lecturers and this hampers their service delivery in this digital age. Abimbade and Ogar (2006) reiterated this fact pointing out that of all the educational problems the nation grapples with, none is as persistent as the one relating to incompetent teachers. A situation like this exposes a persistent skill gap. This skill gap impacts negatively on the use of educational technologies and implementation of e-learning in LIS education in the country.

High Cost of Procurement: Nigeria is yet to make appreciable progress in her quest for technological advancement. As a result, most, if not all, of the technologies required for effective implementation of e-learning mode are sourced from the developed Western countries. These important educational materials are imported at very exorbitant cost caused by a combination of global economic recession and high foreign exchange regime. There are also the additional issues of equally high custom duties and other port charges. The resultant high cost of importation of e-learning technologies is actually borne by the end user. Hence, ICT materials and other technologies used for teaching and learning in LIS Schools in the country are very costly to acquire and maintain. The situation is even compounded by insufficient funding of education in general and LIS Schools in the country.

Incessant Breakdown: In the midst of the challenge of scarcity of basic technologies to drive e-learning in the nation's Library Schools is the related issue of incessant breakdown of the few available ones. Broken-down and unserviceable computers (laptops, desktops, etc), projectors, interactive whiteboards, etc are, indeed, a common sight in most Library Schools in Nigerian tertiary institutions. The reason could range from overuse to procurement of low quality but cheap substitutes to the costly standard technologies. It is unarguable that low quality technologies are more susceptible to wear and tear when subjected to sustained heavy use. Some are even prone to viral attacks and other damages which affect their optimal performance. These incessant breakdown constitute a serious challenge bearing in mind the inadequate funding of these academic units and the problems associated with the procurement of complete knock-down (CKD) parts, repairs and sustained maintenance.

Epileptic Power Supply: Majority of innovative technologies used in LIS education require steady power supply. Unfortunately, the Power Holding Company of Nigeria (PHCN) which is the source of public power supply in the country, has not lived up to general expectation due to irregular supply in most cases and low voltage in some other instances. The alternative is procurement of generators which is quite expensive and beyond the reach of most public institutions, including educational institutions. There is a strong correlation between the inadequate funding of educational institutions in the country and their inability to generate electricity to power their machines and other learning equipment. This prevailing situation undermines maximum use of available innovative technologies for teaching and learning of LIS in various tertiary institutions in Nigeria (Nnadozie, Chukwueke & Iroegbu, 2017).

Conclusion and Recommendations

Electronic learning (e-learning) technologies have become a major driver or enabler of sustainable LIS education in most parts of the world. The popularity which this learning model enjoys in societies where it has been adopted is a clear pointer to its benefits. The major purpose of this paper is to draw attention to the pivotal role which e-learning technologies can play in teaching and learning of Library and Information Science (LIS) in Nigerian. Different methods of e-learning and categories of e-learning technologies were identified with specific insights into their application to LIS education. A number of benefits usually accrue from the full implementation of e-learning in educational institutions. Particular attention in this regard was drawn to such gains as: improved academic performance, sustained students' interest, enhanced lecturers' performance and creation of a more participatory LIS education. However, the appropriation of these advantages is constricted by a catalogue of policy, financial, administrative and attitudinal challenges. These constraints have continued to undermine the integration of e-learning into the mainstream, and subsequent sustainable development of LIS education in Nigeria. It is for this reason that the following recommendations are put forward as practical strategies to improve the density of e-learning technologies and enhance their exploitation for effective teaching and study of LIS in the country:

Improved Funding of Library Schools: A substantial improvement in the funding of the country's tertiary education in general, and LIS education in particular, has become imperative. This is because a greater percentage of the constraints to the migration to e-learning mode in Nigerian Library Schools stems from the prevailing inadequate funding of these academic institutions and their various educational and research undertakings. A massive injection of financial resources would, therefore, facilitate the procurement, installation and maintenance of those e-learning technologies required for LIS education. By so doing, these academic units would have offset most of the financial challenges to the implementation of e-learning model in Nigerian Library Schools.

ICT-based Instructional Strategies: The ICT-based instructional mode should be made compulsory at the tertiary level of educational in the country. This will not only improve delivery of course contents, the students of LIS would be enabled to study at their pace and convenience. Moreover, an ICT-based instructional method would increase the students' participation in classroom and allied instructional activities. This would deepen and vary their learning experience. The most popular of these ICT-based instructional strategies are Computer Assisted Instruction (CAI), game-based instruction, CD-ROM and power-point presentation (Abimbode & Ogar, 2006 and Abodoye & Omotunde, 2015).

Capacity Building: There is no doubt that capacity building for teachers is a sine qua non for quality education. Bearing this in mind, lecturers in the country's Library Schools should be provided opportunities to retool and refresh their knowledge on regular basis. Such capacity building programmes include seminars, workshops, conferences and exhibitions/demonstrations. These avenues should be maximally harnessed. LIS teachers should use these fora to acquire the skills and competences required for effective manipulation of e-learning technologies in teaching and learning sessions. Added to this is the fact that the LIS teacher that participates in capacity building exercises would be abreast of current trends in the use of e-learning technologies.

Curriculum Review: Stakeholders in LIS education in Nigeria, particularly, the Nigeria Library Association (NLA), Librarians' Registration Council of Nigeria (LRCN),

Nigeria Educational Research and Development Council (NERDC) and National Universities Commission (NUC) should expedite efforts to review the LIS curriculum. This exercise will provide the needed opportunity to update and expand the LIS curriculum used in various Library Schools in the country. Such expansion would naturally make specific provision for use of e-learning technologies for teaching, learning, assessment of students and presentation of papers. This conscious infusion of e-learning components will gradually pave the way for its eventual integration into LIS education in the country.

Infrastructure Upgrade: Procurement and maintenance of the needed infrastructural facilities to power the e-learning option are both complicated and capital-intensive. This makes the venture beyond the reach of the already cash-starved Library Schools. It is for this reason that governments at various levels, regulatory authorities and other agencies in the education sector, should collaborate to upgrade the quality of the gamut of infrastructure required for effective implementation of the e-learning method. There is no doubt that installation of these infrastructure would facilitate easier utilization of various technologies for the teaching and learning of LIS courses.

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