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Administrative and infrastructural factors affecting library and information science educators' actual use of educational support systems for teaching in Nigerian universities

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Abstract

This research assumes that administrative and infrastructural factors may explain the low use of educational support systems (ESS) for teaching by library and information science (LIS) educators in Nigerian universities. The literature has focused on the adoption of different types of educational technologies and their use by teachers and students with little consideration for the LIS educators' actual use of ESS for teaching and the effect of institutional support on the use of these systems. Thus, the study seeks to determine the user percentage of ESS for teaching, how the educators actually use ESS for teaching, the nature of administrative and infrastructural support they receive while teaching with ESS and whether the two factors correlate with and predict the actual use of ESS for teaching. A descriptive survey design was adopted and data were collected through a questionnaire. The results indicate that many of the LIS educators did not use ESS for teaching and that their actual use of ESS for the instructional activities highlighted in the study was low and below average. Moreover, the educators were found to have received minimal administrative and infrastructural support. The two factors were also found to have significant positive correlations and a significant and positive joint influence on the actual use of ESS for teaching with a joint contribution of 14.7%. Analysis of their relative contributions to the prediction of actual use revealed that, although the two support factors contributed positively, only infrastructural support contributed significantly at 0.05 level of significance. It was therefore recommended that for administrative support to be meaningful, adequate infrastructural facilities should be provided for an appreciable and sustainable use of ESS for teaching.

Keywords

Administrative support, infrastructural support, educational support systems, library and information science (LIS) educators, Nigerian universities, teaching

Background to the study

Not more than a few decades ago, teacher, textbook and blackboard were the three most significant components of teaching and learning in classrooms while the role of the student in the past was to listen, learn and repeat. Today, teaching and learning no longer centres around the transfer of knowledge from educator to student. Learning now comes from student inquiry, critical thinking and problem solving based on information accessed from a variety of sources enabled by technology (Demirci, 2009). The body of knowledge as well as instructional support tools are very important in imparting knowledge. According to Yusuf and Balogun (2011), it is now possible to design courses in new innovative ways using multimedia tools to support student and educator profiles and competencies, thereby meeting the level and individual needs of each

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student and staff member. With multimedia tools, learners' need and characteristics are discovered and better focused upon in producing necessary educational facilitators.

The synergy of computing and communication technologies significantly impact the way in which information resources are created, managed and used. Demirci (2009) advised that institutions need to plan and implement educational support systems (ESS) which will take advantage of these developments. This is because ESS have now given teachers more power in the classroom by changing how they access, gather, analyse, present and transmit information to their students and peers. ESS are information, communications and telecommunication technologies, equipment and hardware that are deployed to aid teaching and learning in the real and/or remote classroom. Common ESS include electronic and interactive boards, overhead and LCD multimedia projectors, computers, satellite and cable televisions, radio, audio recorders, audio aids, video devices, visual aids, cameras, webcams and camcorders. Others are mobile and handheld technologies (e.g. iPads, smartphones), modems, scanners and/or digitizers, web-based referencing and abstracting tools, library online public access catalogue, integrated learning management systems, tutorials and demos on networks (on Intranet and/or Internet), and other teaching and learning aids.

As the prime actors in implementing technology in teaching and learning, Cavas et al. (2009: 29) opined that:

> teachers should be in the centre of attention. They should be involved in all stages of the implementation and meanwhile be assured that this approach is advantageous over the previous one, is compatible with their teaching practices and they will be given any technical help and training. As a consequence of integrating technology in education a change is expected to occur in the style of teaching and learning. … For this to be realized the teachers must be supported with instructional materials and teaching models.

For successful implementation of ESS for teaching therefore, it is important to understand how and why educators use technology and to explore the issues and barriers they encounter when trying to incorporate ESS into their lectures.

Although Trucano (2005) averred that the existence of technology does not transform educators' teaching practices in and of itself, he maintained nevertheless that technology can enable them to transform their teaching practices, given their readiness, a set of enabling working conditions and the support and cooperation of administrators. Adequacy and quality of software and hardware, incentives to change and support received in the school, among others, have been identified by Demirci (2009) as factors affecting educators' decision to use new technologies in classrooms and Hsu et al. (2007) in a study carried out in Taiwan found available school infrastructure as one of the factors that affected instructors' technology-based teaching practices.

For educators to use ESS for teaching, administrative and infrastructural supports must be seen not only to be available and accessible but also ready, sufficient and/or adequate. In addition, administrators must be seen to take the lead by using and allowing the use of ESS and not only paying lip service to the use of technology for teaching. Previous research studies have shown institutional support to positively affect the actual use of technology. Guha (2003) and Wong (2004) have found institutional support to contribute to or inhibit educators' performance in using technology. Smarkola (2008) found that some American educators believed that with the introduction of ESS for teaching, they would be limited by the resources and supports available to them in their schools and would have very little control over the learning environments.

On the Nigerian scene, Aremu and Adediran (2011) and Adedoja and Abimbade (2013) opined that Nigerian teachers' readiness to use and the actual use of instructional technology would increase with strong support from their school administrators and communities. On the challenges faced by the LIS schools in Nigeria in their bid to integrate technology into teaching, Abubakar (2014) found lack of: computer laboratories, expertise and managerial support, among others. Similarly, Edegbo (2011) in his review of the literature asserted that a good number of LIS schools did not have dedicated ICT laboratories. Confirming this, a more recent study by Mbagwu et al. (2017) found that the space provided for ICT laboratories in some of the LIS schools in Nigeria was too small to accommodate the students for practical hands-on use. They advised that for efficient and effective use of a laboratory, its accommodation should be spacious enough to allow for easy movement of the educators and their students. According to Kamba (2011), most LIS schools teach ICT courses theoretically because they have inadequate laboratories. This lack of opportunity for practical exposure to technology for both educators and students may impact on teaching practices and learning outcomes.

It has been found that most of technology integrations in Nigerian universities were for administrative purposes rather than for classroom teaching and learning. For instance, a study conducted by Atsumbe et al. (2012) discovered that in Nigerian universities e-learning infrastructures are not adequate for teaching and learning and that management's efforts towards the development of ICTs is mainly for administrative purposes. Similarly, the Obahiagbon and Osahon (2014) survey of the use of ICTs by 150 students and 50 lecturers from both University of Benin and Benson Idahosa University revealed that ICTs are used more for administrative purposes (such as hostel allocation, course registration, admissions, employment, among others) than for teaching and learning. Although there is significant investment in ICT facilities in both

institutions, ICT tools for teaching and learning are yet to receive the attention they deserve.

An effort to promote the use of technology for teaching and learning has been made by the National Universities Commission (NUC) through the establishment of e-learning platforms fitted with 20 smart boards in 12 Federal universities in Nigeria (Ajegbelen, 2016). Although this effort is commendable, it is far from the norm and akin to a drop in the ocean considering that there are more than 112 public and private universities in the country as at 2012 (NUC, 2012). The number of subgraduate, undergraduate and postgraduate programmes requiring urgent overhauling of standards via technological intervention in teaching and learning should also be another consideration in any technology teaching and learning intervention.

Institutional intervention is needed to address factors that may limit the adoption and integration of technology in teaching such as a lack of suitable educational software; lack of ICTs mainstreaming into school's strategy and outdated or poorly maintained hardware (Buabeng-Andoh, 2012). Ajegbelen (2016) also identified poor network infrastructure and poorly maintained equipment as prominent obstacles to the integration of technology in teaching in Nigerian universities. According to him, poor equipment would have a negative impact on a teacher's desire to integrate technology in teaching.

To summarize, it can therefore be argued that in evaluating the technology integration decisions made by educators, there must be an acknowledgement that technology integration in teaching depends on the technologies that are on the ground and the support offered for the use of technology by institutions. Hence, this study, on the assumption that some of these educational support systems are available and accessible to the LIS educators, seeks to determine the effects (if any) of administrative and infrastructural support on the educators' actual use of ESS for teaching in Nigerian universities.

Problem statement and the significance of the study

The integration and use ESS for teaching by the LIS educators in Nigerian universities have been observed to be slow and low. The infrastructural facilities to support the use of ESS for teaching are observed to be lacking or inadequate in most of these universities. Oftentimes, requests for system repair and maintenance, system and software upgrades, purchase of peripherals and other consumables while using ESS for teaching are not always met by administrators because of inadequate funding. Furthermore, most of the administrators were reported not to be using or providing technological leadership, encouragement and support in the actual use of ESS by the educators for teaching in these universities.

A literature search undertaken for the study revealed that, though much has been written about the general use of ICTs and multimedia resources by secondary school teachers, students, librarians and general faculty in Nigerian universities, institutional factors affecting LIS educators' actual use of technology for teaching have not been well researched. It was on this premise that the study investigated the infrastructural and administrative factors affecting the actual use of ESS by LIS educators for teaching in Nigerian universities with the aim of proffering solutions to the identified problem in order to enhance teaching quality and effectiveness.

The information gathered from this study could be helpful in providing: (1) university administrators and policy makers with data to help them make more informed decisions on ESS integration and appropriate teacher support for their instructional use in universities; (2) educational planners with information about how allocated resources affect educators' actual use of ESS for teaching; (3) a reference point for other academic departments in Nigerian universities and other higher institutions of learning in the country as their educators are assisted in developing the most effective but sustainable ways of embracing, promoting and actually using ESS for teaching, hoping to enjoy the full opportunities it has come to offer.

Objectives of the study

The main objective of this study was to investigate the administrative and infrastructural factors affecting the actual use of ESS by LIS educators for teaching in Nigerian universities. The specific objectives were to determine: the percentage of users of ESS for teaching (at least once in a week) among the educators and how they actually use ESS for teaching; the nature of administrative and infrastructural support the educators are given while teaching with ESS; the relationship and joint influence of administrative and infrastructural supports on the actual use of ESS; and the relative contributions of administrative and infrastructural support in predicting actual use of ESS for teaching.

Literature review: Administrative and infrastructural factors affecting the use of ESS

In developing countries, despite a great deal of recent progress and optimism that many more educators can benefit from access to technology, the infrastructure necessary for deploying technological resources is lacking and many educators are working in conditions that are not conducive to or supportive of technology use (Hennessy et al., 2010). While the learning benefits of technology are widely recognized by academics and practitioners, the context in

which educators operate often affects their actual use of educational technologies to achieve teaching and learning outcomes. Availability of resources and whole school characteristics, culture and ethos have been found to be highly influential in the instructional use of technology (Grainger and Tolhurst, 2005).

A review of literature on the use of ICT within an educational context in the UK cited by Afshari et al. (2009) highlighted a number of factors that enable educators to successfully engage in innovative practices. These were: support at senior management level for implementing new practices and addressing financial implications of equipment acquisition where appropriate. In other words, administrative and infrastructural support are essential to the adoption and use of instructional technology.

The report of the World Link Programme, a School ICT Project of the World Bank cited by Hennessy et al. (2010) found that although teachers enthusiastically engage in collaborative projects and often portray constructivist pedagogy, school administrators offer very little structural support and few incentives to use the technology effectively in the classroom. Trucano (2005) had earlier listed some incentives to encourage the use of instructional technology to include certification, professional advancement, pay increases, paid time off to participate in professional development, and formal and informal recognition at the school and community levels.

Preliminary investigation revealed that individual LIS educators' initiative accounts for most of the implementation of ESS in Nigerian universities. Lack of support by administrators has been identified in the literature (Afshari et al., 2010; Hennessy et al., 2010, among others) as a significant barrier toward the implementation of technology in classrooms. It therefore follows that successful implementation of ESS can only occur if administrators offer support and leadership to teachers. Administrative support has also been found to be an important element in establishing ESS as a part of the school culture. Administrative support is a critical predictor of ESS integration, since it focuses on promoting the use of ESS at a strategic and action level. If leaders are cognizant of the benefits to be gained from using technology in the teaching and learning process, technology use in schools is more likely (Afshari et al., 2009). Therefore, school leaders should be role models and should make ESS a tool in their everyday life.

The management of universities and departments fully control instructional resources, personnel and finance to procure new materials and equipment. Hence, it can be argued that little can be achieved (and much might be lost) without their endorsement and active support. Echoing this view, Abdo and Semela (2010) opined that the degree to which a head of department and/or institution offers or deprives teachers of instructional opportunities shapes their decision to engage or not to engage in a teaching task. This is because heads of department and/or institution are educational leaders who shape and communicate visions of teaching and learning to teachers within their departments and/or institution and by their action or inaction influence school activities. Hence, a lack of mentors has been identified as an obstacle that may impact on newly qualified educators' ability to use technology (Slaouti and Barton, 2007).

Butler and Sellbom (2002: 27) carried out a study on barriers to adopting technology for teaching and learning at the Ball State University, Muncie, Indiana and recommended that 'schools should work to encourage the purchase of highly reliable technologies; identify attitudes and behaviours that are seen as poor or inadequate and support staff to reduce these'. Afshari et al. (2009) in their review of literature concluded that support from administrators and institutions are factors affecting educators' decision to use ICT. Hence, LIS educators need administrative supports when they decide to use ESS in their classes.

On infrastructural support, a study by Gulbahar and Guven (2008) reported insufficient technological infrastructure as factor that had a significant impact on the effective use of technology by educators in Turkey. Similarly, Afshari, et al. (2009, 2010) listed support; administrative methods and strategies; funds to purchase hardware and software; school infrastructure; hardware and software resources; and management workload as factors affecting educators' use of technology in classroom. They asserted that school budgets must include funds for training, hardware and software upgrades, replacement parts and financial assistance to help teachers purchase computers.

Lack of necessary hardware and software in the classroom can seriously limit what teachers and students are able to do with technology. Past studies (Afshari et al., 2009; Askar et al., 2006 and Grainger and Tolhurst, 2005) found a lack of financial resources and/or insufficient budget, on-site support, the students, personal development, technology implementation committee and limited resources within schools as impediments to the actual use of technology by teachers. According to Peeraer and Petegem (2011), teachers should have access to some financial resources and schools should provide supportive networks for teachers, especially those who are not confident enough to take up technology. YuLi (2008), while examining factors affecting the integration of ICT in teaching English in Taiwan, revealed that teachers will use technology for teaching if they can pass the money and energy (that is, finance and electrical power) thresholds. Related to that is the Gulbahar and Guven's (2008) highlight of issues Turkish teachers face while teaching with technology which include the maintenance of hardware, the purchase of new equipment and software and the high

costs involved in providing and updating networked equipment needed for teaching.

An all-embracing view by Hennessy et al. (2010) attributed the reluctance of teachers to embrace computer technology in Sub-Saharan Africa to a number of factors that include: anxiety from dealing with equipment; lack of time and effort for training; the need to remain current in the field and to appropriately implement the technology in the classroom; a sense of loss of control over the teaching situation; hardware and software quality; and availability. Similarly, Bauer and Kenton (2005) in a qualitative study that examined the classroom practice of 30 'tech-savvy' teachers who used computer technology for teaching in USA, found that the teachers who were highly educated and skilled with technology, were innovative and adept at overcoming obstacles, but that they did not integrate technology on a consistent basis as both a teaching and learning tool. They stated the teachers' concerns as outdated hardware and lack of appropriate software, among others.

Other issues to be addressed while integrating technology into teaching, according to YuLi (2008), are limited server capacity, unstable network connectivity, frequent changes in hardware and platforms, and school policies. Successful technology implementation in the classroom therefore, requires not only computers but commitment and community, with the last two being closely interlinked (Afshari et al., 2009). Since educators often feel obligated to use instructional technology by wider educational pressures, imperatives or developments and a broader social need for digital literacy, school finances, culture and leadership invariably impact on this resourcing (Phelps and Maddison, 2008). This is because where funding is inadequate, school cultural perception of ESS is negative and no technological leadership is provided, there will be non- or low use of ESS for teaching.

In summary, it was established from the literature that educators need administrative and infrastructural support and strong technological leadership from school managers and administrators to develop and use ESS in order to truly transform teaching and learning. There is no doubt that the use of ESS for teaching is complicated by the unique environment in which the teacher works and the student learns.

Methodology

This section presents the questions to be answered by the study; the hypotheses to be tested; the scope, research design, population, sample size and technique, procedures for instrumentation and data collection and methods of data analysis.

Research questions

The research questions are:

1. What percentage of the LIS educators in Nigerian universities use ESS for teaching at least once in a week?
2. How do the educators actually use ESS for teaching?
3. Are the educators given administrative and infrastructural support while teaching with ESS?

Hypotheses

The following hypotheses were tested at 0.05 alpha level of significance:

1. There is significant relationship between administrative support and the actual use of ESS for teaching.
2. There is significant relationship between infrastructural support and the actual use of ESS for teaching.
3. Administrative and infrastructural support have significant joint influence on the LIS educators' actual use of ESS for teaching.
4. Administrative and infrastructural support have significant relative contributions to the prediction of actual use of ESS by the educators for teaching.

Scope of the study

The study is an investigation of the administrative and infrastructural factors affecting the use of ESS for teaching by LIS educators in Nigerian universities. The population of the study consists of all (full/part time) LIS educators that were engaged by the 27 university-based LIS schools in Nigeria as at 2014/2015 academic session. The study ascertained the teaching use percentage of ESS (at least once in a week) among the educators and how the educators actually use ESS for teaching in these universities. Administrative and infrastructural support are the factors that were examined. The influence of these factors on actual use of ESS for teaching was investigated using inferential statistics.

Design

A descriptive survey design was adopted for the study. This is because it is the most appropriate in systematically collecting and analysing data without any manipulation or control.

Population

The target population of this study consisted of all (full/part time) LIS educators engaged in the 27 universities offering LIS courses. This totals 293 from the figures collected from the universities as at 2014/2015 academic year.

Sample size and sampling technique

The sampling technique that was adopted for the study is total enumeration. All the 293 LIS educators engaged in the 27 universities offering LIS programmes in Nigeria were covered in the study. This is because the population is not too large to manage.

Instrumentation

A questionnaire was distributed to the LIS educators. The questionnaire tagged 'LIS Educators' Administrative and Infrastructural Supports Survey (LEAISS)' was used to collect data for the study. A questionnaire was chosen as the instrument because it is appropriate considering the nature of the data, the research design and analyses required, number of respondents, their dispersion and time. The questionnaire consists of three sections or scales.

Section A tagged 'Percentage Use of ESS by the LIS Educators (PUELE)' was designed to collect data on the use of ESS for teaching (at least once in a week) by the educators. The items in this section were adapted from the study of Akinde and Adetimirin (2017b). The respondents were required to indicate, by ticking, their use of 21 ESS tools for teaching on a scale that ranged from daily (DLY), every-other-day (EOD) to weekly (WKL). The frequency counts and percentages indicated the magnitude of the responses for analyses and interpretations.

Section B was on LIS Educators' Actual Use of ESS (LEAUE) and contained 20 items measuring the dependent variable 'Actual use'. The items were adapted from Akinde and Adetimirin (2017a). The respondents were asked to indicate their level of agreement to statements on how they actually put ESS to use for teaching. All items were stated in the affirmative. Items were put on a four-point Likert-type scale ranging from Strongly Agree, SA (4 points); Agree, A (3 points); Disagree, D (2 points) and Strongly Disagree, SD (1 point) with 2.5 (calculated as: 4+1=5/2) as the average mean. A mean score above 2.5 was taken as a good level of use and vice versa.

Section C was on Administrative and Infrastructural Support for the Use of ESS (AISUE). The scale was partly adapted from the studies of Gulbahar and Guven (2008) and Abdo and Semela (2010) and partly developed by the researchers from insights from the relevant literature reviewed. Ten items were used to collect data on the nature of administrative and infrastructural support received by the educators while teaching with ESS. Respondents were required to indicate their level of agreement to the support statements (that is, with Strongly Agree 4 and Strongly Disagree 1 as extreme values). All items in this scale were stated in the affirmative with 2.5 average mean as the standard for measurement, analysis and interpretation.

While searching for validity, the calculated average mean of 2.5 for Section B and C was compared with the cut-off points for items' mean in accordance with the Gregory and Ward (1978) formula for determining the lower and upper limits in mean. This formula is stated thus: SA 3.50–4.00 points, A 2.50–3.49 points, D 1.50–2.49 points and SD 0.5–1.49 points. It was found that decisions made based on the calculated average mean of 2.5 were not different from those made based on the suggestions of Gregory and Ward (1978). Hence, any mean score above 2.50 was taken as agreed/high level of use or support while mean score below 2.50 was regarded as disagreed/low level of use or support.

Table 1. Reliability coefficients of the questionnaire scales.

Sections	Title	Alpha values (r)
B.	Actual Use of ESS for teaching	0.95
C.	Supports for the Use of ESS	0.96

Validity and reliability of the instrument. Face and content validity of the instruments was established by subjecting them to initial item screening and vetting by three experts (from the fields of library studies, educational technology and information science) who were asked to affirm the adequacy, clarity, technicality and exhaustiveness or otherwise of the items in line with the research objectives. The exercise helps in improving item quality and removing some ambiguities. For pre-test, a trial data collection was made on 22 LIS educators from four federal polytechnics in Nigeria (Nekede, Oko, Ede and Offa) between September and October 2014. The data collected from the pre-test was used to improve on the reliability of the questionnaire by calculating the reliability coefficient values for the scales using Cronbach Alpha method contained in the Statistical Package for Social Sciences (SPSS). Some of the items with low reliability coefficients (either because they were misunderstood; failed to convey the right meaning and/or collect the desired answers) were eliminated.

The Cronbach Alpha values for the remaining items were confirmed for Section B and C and the result is as presented in Table 1.

According to Hair et al. (2010), a Cronbach Alpha value of more than 0.70 indicates that the items are homogeneous, measuring the same constant and demonstrating that the questionnaire is a reliable measuring instrument. Thus, the questionnaire used in this study showed a good level in terms of reliability because the reliability coefficient values for the scales were above 0.70.

Data collection procedure

The questionnaire was distributed to all the LIS educators engaged in the 27 universities in their respective schools, after obtaining permission from the heads of LIS

department, on a hand-to-hand basis. This was to allow for early responses, easy and immediate returns and an opportunity to clarify doubt, if any. Five research assistants were engaged and trained to assist in collecting the data with the researcher. A letter to the respondents, introducing the survey and the researcher; describing the reasons for the survey and soliciting the educators' help in promptly filling and returning the questionnaire was the cover page of the questionnaire.

The administration of the questionnaire took place during school hours in each of the schools. A visit-day was allocated to each school to distribute questionnaire. Copies of the questionnaire that were filled and returned immediately were collected. A return visit at a one-week interval was made to some schools to collect copies of the questionnaire outstanding. After the initial retrieval, reminder SMS were sent through some contacts in universities with low rates of return, to those who had not responded, in order to ensure at least 50% rate of response per university. The researcher resorted to postal and courier services and/or phone call to retrieve copies of the questionnaire outstanding. The data collection exercise took five months (February to June 2015) in all.

Instrument return rate

Of the 293 copies of the questionnaire distributed, 211 copies were returned of which only 208 copies were complete, giving a response rate of 72%.

Method of data analysis

The data collected from the respondents were described, summarized and analysed with descriptive and inferential statistics using the SPSS version 18. All statistical significance tests were made at alpha 0.05. The three research questions were answered using descriptive statistics such as frequency distribution, percentages displayed in tables, means and standard deviation. These statistical methods were used because they were sufficient and appropriate to answer the questions. The four hypotheses were tested with inferential statistics. Hypotheses 1 and 2 were tested using Pearson Product Moment Correlation. This correlational statistics method is the most relevant in testing for the relationship (if any) between each of the independent variables and the dependent variable. The remaining hypotheses (3 and 4) were tested using Multiple Regression Analysis and Analysis of Variance (ANOVA). This is because Multiple Regression Analysis is the most recommended for testing for the joint and relative contributions of all and/or each of the independent variables to the prediction of the dependent variable while the ANOVA is the most appropriate in determining the magnitude and significance of their variances.

Research result

Analysis of research questions

Three research questions were answered in the study. The findings are presented below.

> Research question 1: What percentage of the LIS educators in Nigerian universities use ESS for teaching at least once in a week?

Users and non-users of ESS (at least once in a week) among the LIS educators are presented in percentages in Table 2.

From Table 2, it was revealed that the non-use percentage of 12 out of the 21 ESS tools ranges from 51.92% to 70.67% while the use percentage of 9 out of the 21 tools was found to be between the ranges of 51.00% to 66.35%. Furthermore, the highest user frequency recorded was 138 while the highest non-use frequency recorded was 147. Thus, the average educators' use percentage of the ESS tools is 47.07% (calculated as grand total of users' percentages divided by 2100 (21x100) multiplied by 100; that is, 988.49/2100x100) while the average educators' non-use percentage is 52.96% (calculated as grand total of non-users' percentages divided by 2100 multiplied by 100; that is, 1112.13/2100x100). Therefore, it can be said that, in the absolute, many of the LIS educators did not use ESS for teaching.

> Research question 2: How do the educators actually use ESS for teaching in Nigerian universities?

The result of the descriptive statistical analysis of the LIS educators' actual use of educational support systems for teaching in Nigerian universities is shown in Table 3.

The respondents were asked to indicate their level of agreement to statements on how they actually put ESS to use for teaching. The result shows that majority of the respondents used ESS to read in preparation for lectures ($\bar{x}$ = 3.52, σ = 2.27); to source for graphics, pictorials and audio-visuals to enhance lectures ($\bar{x}$ = 2.44, σ = .99); to distribute tutorials and/or 'take-homes' to students ($\bar{x}$ = 2.39, σ = 1.03) and to reproduce, replay and duplicate lecture content ($\bar{x}$ = 2.37, σ =1.03).

Not many of the educators used ESS to develop lecture content ($\bar{x}$ = 1.80, σ = .89) and produce lesson notes/plans ($\bar{x}$ = 1.87, σ = .94) while a few used ESS to subscribe for and receive relevant teaching materials from publishers ($\bar{x}$ = 1.98, σ = .89) and to assess student performance, average their grades and generate reports ($\bar{x}$ = 2.00, σ = .89).

Overall, with a grand mean of 2.25 (which is below 2.5 calculated as the average mean), the scale was taken as low. In other words, the respondents' actual use of ESS for the instructional activities highlighted in the study was

Table 2. Percentage use (at least once in a week) of ESS by the LIS educators.

S/N	ESS use for teaching	DLY		EOD		WKL		Total users		Total non-users	
		N	%	N	%	N	%	N	%	N	%
1.	Camcorders	38	18.30	07	3.40	16	7.70	61	29.30	147	70.67
2.	Web Cameras	40	19.20	14	6.70	12	5.80	66	31.70	142	68.27
3.	Analogue/digital cameras	36	17.30	22	10.60	09	4.30	67	32.21	141	67.79
4.	Analogue/digital video devices/visual aids	44	21.20	08	3.80	18	8.70	70	33.70	138	66.35
5.	Discussion/mailing lists, Listservs & Newsgroups	40	19.20	21	10.10	22	10.6	83	40.00	125	60.09
6.	Radio cassette/audio recorder/audio aids	54	26.00	23	11.10	06	2.90	83	40.00	125	60.09
7.	Electronic bulletin boards for news	59	28.40	18	8.70	07	3.40	84	40.40	124	59.62
8.	Social/academic networking media	51	24.50	26	12.50	07	3.40	84	40.40	124	59.62
9.	Overhead/LCD multimedia projectors	40	19.20	18	8.70	27	13.00	85	40.90	123	59.14
10.	Online Public Access Catalogues	56	26.90	15	7.20	20	9.60	91	43.75	117	56.25
11.	Websites/blogs	58	27.90	23	11.10	25	12.00	106	51.00*	102	49.04
12.	Intercom and fixed line telephones	72	34.60	13	6.30	15	7.20	100	48.10	108	51.92
13.	Public address system/portable mini-microphones	55	26.40	16	7.70	26	12.50	97	46.64	111	53.37
14.	Intranet (department- and campus-wide)	65	31.30	28	13.50	14	6.70	107	51.50*	101	48.56
15.	Satellites/cable TVs/plasmas/laserdiscs	81	38.90	18	8.70	12	5.80	111	53.40*	97	46.64
16.	Scanners/digitizers	65	31.30	28	13.50	32	15.40	125	60.20*	83	40.00
17.	Computers (desktops & laptops)	84	40.40	19	9.10	19	9.10	122	58.65*	86	41.35
18.	Mobile and handheld technologies	97	46.60	22	10.60	08	3.85	127	61.06*	81	38.94
19.	Modems/Wi-fi/wireless	86	41.30	24	11.50	11	5.30	121	58.17*	87	41.83
20.	Cable/wired Internet	76	36.50	30	14.40	21	10.10	127	61.06*	81	38.94
21.	Electronic whiteboards	92	44.20	26	12.50	20	9.60	138	66.35*	70	33.65
Grand total of user and non-user percentages								**988.49**		**1112.13**	
Average user and non-user percentages								**47.07**		**52.96**	

*above average use; DLY (Daily); EOD (Every Other Day) and WKL (Weekly); frequency count: *n*=208.

low. This implies that the use of ESS by the educators for teaching LIS course was below average.

Research question 3: Are the educators given administrative and infrastructural support while teaching with ESS?

Findings from the descriptive analysis of the administrative and infrastructural supports received by the LIS educators when teaching with ESS are presented in Table 4.

It is worthy of note that none of the item mean scores is up to the average mean of 2.5. Policies and rules concerning the use of available ESS for teaching had encouraged the use of ESS for teaching ($\bar{x}$ = 2.42, σ = 1.02) and there was electricity to power the ESS tools needed for teaching ($\bar{x}$ = 2.41, σ = 0.93) had the highest responses but with mean scores below average. However, a few of the educators revealed that their offices and/or university libraries had necessary facilities to enable their using ESS to prepare (for) lectures ($\bar{x}$ = 1.81, σ = .83) and that ESS necessary for lecture delivery were installed in classrooms in their department and/or institution ($\bar{x}$ = 1.77, σ = 0.75).

The two institutional support indices had mean scores lower than the average mean (2.50) (infrastructural support = 2.10 while administrative support = 2.32). In the absolute and with a grand mean of 2.21, the Support scale was taken as low (2.21<2.50). Hence, it can be said that the administrative and infrastructural supports coming to the LIS educators from their departments and/or universities while teaching with ESS was low and minimal.

Hypotheses testing

Four hypotheses were tested at 0.05 alpha level of significance. The findings are presented below.

Hypothesis 1: There is significant relationship between administrative support and the actual use of ESS for teaching.

The result of the correlation analysis of administrative support on the actual use of ESS for teaching is shown in Table 5.

The results in Table 5 showed that administrative support correlated with actual use and had significant positive influence (r = 0.337, *N* = 208, *p*=.000). Therefore, the first hypothesis was accepted. This means that administrative

Table 3. Actual use of ESS for teaching by the LIS educators.

S/N	Statements	SA		A		D		SD		Mean ($\bar{x}$)	SD (σ)
		N	%	N	%	N	%	N	%		
1.	I use ESS to read in preparation for lectures	13	6.8	25	13.0	71	37.0	83	43.2	3.52	2.27
15.	I use ESS to source for graphics, pictorials and audio-visuals to enhance my lectures	24	12.7	44	23.3	75	39.7	46	24.3	2.44	.99
13.	I use ESS to distribute tutorials and/or 'take-homes' to students	28	15.1	69	37.1	60	32.3	29	15.6	2.39	1.03
10.	I reproduce, replay and duplicate lecture content with ESS	29	15.4	50	26.6	64	34.0	45	23.9	2.37	1.03
14.	I use ESS to store and retrieve my past lesson notes	20	10.6	53	28.2	71	37.8	44	23.4	2.36	.93
11.	I use ESS to publish class-works or projects	33	17.8	57	30.8	62	33.5	33	17.8	2.32	1.00
9.	I use ESS to deliver lectures in the classroom (real/remote)	29	15.5	57	30.5	60	32.1	41	21.9	2.31	.98
8.	I use ESS to display subjects' syllabi and/or courses' outlines	31	16.6	65	34.8	52	27.8	39	20.9	2.29	1.04
18.	I use ESS to present, submit and publish my students' reports	29	15.3	57	30.2	70	37.0	33	17.5	2.28	.94
19.	I use ESS to store and keep track of my students' grades (marks)	25	13.2	48	25.4	73	38.6	43	22.8	2.27	.98
20.	I use ESS to source for bibliographic details of good materials	14	7.4	29	15.3	83	43.7	64	33.7	2.26	.97
12.	I mandate students to submit their tests, assignments, seminars and projects via ESS	27	14.2	73	38.4	59	31.1	31	16.3	2.25	1.03
16.	I use ESS to source for current thoughts, ideas & information to enhance my lectures	12	6.4	35	18.5	87	46.0	55	29.1	2.18	1.00
6.	I use ESS to charge/discharge library resources on loan to me	39	20.6	51	27.0	56	29.6	43	22.8	2.04	.94
2.	I use ESS to search for literature relevant to my teaching subject	9	4.7	17	8.9	75	39.3	90	47.1	2.03	1.06
5.	I use ESS for citations and referencing purposes	11	5.9	31	16.6	85	45.5	60	32.1	2.01	.94
17.	I use ESS to assess student performance, average their grades and generate reports	27	14.3	58	30.7	66	34.9	38	20.1	2.00	.89
7.	I use ESS to subscribe for and receive relevant teaching materials from publishers	30	16.1	50	26.9	58	31.2	48	25.8	1.98	.89
4.	I use ESS to produce lesson plans or notes	13	7.0	28	15.0	81	43.3	65	34.8	1.87	.94
3.	I use ESS to develop lecture content	12	6.3	26	13.7	79	41.6	73	38.4	1.80	.89
Overall actual use Mean and SD										**2.25**	**1.04**

support influenced significantly and positively the actual use of ESS for teaching.

Hypothesis 2: There is significant relationship between infrastructural support and the actual use of ESS for teaching.

Correlation analysis result of infrastructural support on the actual use of ESS for teaching is presented in Table 6.

The results in Table 6 showed that infrastructural support correlated with actual use and had significant positive influence ($r = 0.376$, $N = 208$, $p = .000$). Hence, the second hypothesis was validated. This means that infrastructural support had a significant and positive influence on the actual use of ESS for teaching.

Hypothesis 3: Administrative and infrastructural support have significant joint influence on the LIS educators' actual use of ESS for teaching.

The joint influence of the two independent variables on the dependent variable is shown in Table 7. The result of the multiple regression analysis of the joint influence of administrative and infrastructural supports on the actual use of ESS for teaching, displayed in Table 7, yielded coefficients of $R = 0.400$, $R^2 = 0.160$ and Adjusted $R^2 = 0.147$. This suggests that administrative and infrastructural supports jointly contributed 14.7% (Adj.$R^2 = 0.147$) to the prediction of actual use of ESS for teaching.

The ANOVA result for the regression revealed that there was a significant and positive joint influence of

Table 4. Infrastructural and administrative support for the use of ESS for teaching.

S/N	Support items	SA		A		D		SD		Mean ($\bar{x}$)	SD (σ)
		N	%	N	%	N	%	N	%		
Infrastructural support											
1	My office and/or university library has necessary facilities to enable my using ESS to prepare (for) lectures	9	4.3	29	13.9	84	40.4	86	41.3	1.81	.83
2	ESS necessary for lecture delivery are installed in classrooms in my department	4	1.9	28	13.5	92	44.2	84	40.4	1.77	.75
3	The state of facilities in my institution/ university library/department encourages me to use ESS for teaching	27	13.0	45	21.6	93	44.7	43	20.7	2.27	.93
4	My institution and/or department has electricity to power the ESS tools needed for teaching	35	16.8	82	39.4	62	29.8	29	13.9	2.41	.93
5	My department provides electrical power backups like UPS, inverters and generator whenever I teach with ESS	30	14.4	64	30.8	64	30.8	50	24.0	2.36	1.00
6	My department provides systems backups (tapes, CDs, flash, hard disks) for me to backup instructional materials	13	6.3	44	21.2	80	38.5	71	34.1	2.00	.90
*Negative (2.10 < 2.50) **Mean and SD for infrastructural support**										**2.10***	**0.89**
Administrative support											
7	Policies and rules concerning the use of available ESS for teaching has encouraged my use of ESS for teaching	37	17.8	59	28.4	67	32.2	45	21.6	2.42	1.02
8	My institution's/department's ethos, culture and priority has encouraged my use of ESS for teaching	30	14.4	66	31.7	69	33.2	43	20.7	2.40	.97
9	Recognition or reward systems are instituted by my institution for educators that use ESS for teaching	21	10.1	54	26.0	89	42.9	44	21.2	2.25	.90
10	The ESS-for-teaching talks, seminars and workshops organized/sponsored by my institutional management has encouraged my use of ESS for teaching	24	11.5	47	22.6	87	41.8	50	24.0	2.22	.94
*Negative (2.32 < 2.50) **Mean and SD for administrative support**										**2.32***	**0.96**
*Negative (2.21 < 2.50) **Overall support Mean and SD**										**2.21***	**0.93**

Table 5. Relationship between administrative support and actual use of ESS for teaching.

Variables	Mean	Std. Deviation	N	R	P	Remark
Administrative support	9.5859	2.82711	208	.337*	.000	Sig.
Actual use	43.6641	15.57318				

*significant ($p < 0.05$).

administrative and infrastructural support on actual use of ESS for teaching ($F_{(2, 206)} = 19.6457$, P = .000). Hence, the third hypothesis was confirmed. This means that administrative and infrastructural support significantly and positively influenced the actual use of ESS by the LIS educators for teaching. This result implies that the joint contribution of the two independent variables to actual use was significant and that other variables not included in this model might have accounted for the remaining variance.

Hypothesis 4: Administrative and infrastructural support have significant relative contributions to the prediction of actual use of ESS by the LIS educators for teaching.

The relative contributions of each of the independent variables to the dependent variable are shown in Table 8. The result of the multiple regression analysis of the relative contributions of administrative and infrastructural

Table 6. Relationship between infrastructural support and the actual use of ESS.

Variables	Mean	Std. Deviation	N	R	P	Remark
Infrastructural support	13.6563	4.04782	208	.376*	.000	Sig.
Actual use	43.6641	15.57318				

*significant ($p < 0.05$).

Table 7. Administrative and infrastructural supports on the actual use of ESS.

Multiple regression result
R = 0.400* R Square = 0.160 Adjusted R square = 0.147 Std. Error =14.38523

ANOVA for the Regression

Model	Sum of squares	df	Mean square	F	P	Remark
Regression	4933.705	2	2466.853	19.6457	.000[a]	Sig.
Residual	25866.850	206	125.5672			
Total	30800.555	208				

[a]= significant at $p<0.05$.

support to the prediction of actual use of ESS for teaching shows positive and significant contribution of infrastructural support (β = 0.271, t = 2.631, P = 0.010) and a non-significant but positive contribution of administrative support (β = 0.173, t = 1.685, P = 0.094). Hence, the fourth hypothesis is therefore accepted for infrastructural support and rejected for administrative support.

This result implies that the relative contribution of infrastructural support to the prediction of actual use of ESS for teaching was positive and significant while that of administrative support was equally positive but not significant.

Discussion of findings

Answers to the research questions:

Percentage use of ESS for teaching (at least once in a week) among the LIS educators. The result indicated that the average educators' use percentage of the ESS tools (at least once a week) is 47.07% while the average educators' non-use percentage is 52.96%. Therefore, it can be said that, in the absolute, many of the LIS educators did not use ESS for teaching. This implies that many of the LIS educators were either non-users or non-regular users of ESS for teaching in Nigerian universities. The finding revealed that the user percentage of ESS for teaching among the educators was low.

This finding supported that of Ololube et al. (2014) on blended teaching and learning in Sub-Saharan Africa which found that many instructional technologies were rarely employed in Nigerian higher institutions of learning. Moreover, the Mbagwu et al. (2017) survey of 109 lecturers and librarians of the five universities offering LIS at the undergraduate level in South-East Nigeria revealed that the use of technology in teaching and learning is generally of low extent. This finding is similar to that of Peeraer and Petegem (2011) in Vietnam and Ofuyatan et al. (2014) in Nigeria who found limited use of modern systems and resources for teaching in higher education. Furthermore, Hamilton-Ekeke and Mbachu (2015) investigated the usage of ICT facilities in three faculties of the Niger Delta University, Bayelsa State, Nigeria and found low integration of ICTs into teaching and learning. Likewise, Ezenwafor et al. (2013) studied the extent to which technology and vocational educators in South-East Nigerian tertiary institutions utilise e-learning resources for instruction and found out that the respondents utilize e-learning resources to a low extent.

In a related West African study, Wilson and Boateng (2014) looked at the issues and implications of integrating ICTs into teacher education universities and two colleges of education in Ghana with a focus on the pedagogical practices of 75 instructors. The result showed that technology use and literacy level among the instructors was still low. Findings from these empirical studies showed that there is room for improvement in educators' technology teaching use behaviour. Therefore, adequate support in the use of these systems may lead to increased experience and use for teaching although resource availability and accessibility, and pedagogical knowledge or skills in the use of ICT may impact on this behaviour.

In contrast to this finding of low use is the Nigerian survey of Bamigboye et al. (2013) on the attitude and competency towards the use of ICT resources by 211 lecturers from nine colleges of the Federal University of Agriculture,

Table 8. Relative contribution of administrative and infrastructural support to the prediction of actual use of ESS for teaching.

Model	Unstandardized coefficients	Standardized coefficients	Beta (β)	T	Sig.
	B	Std. Error			
(Constant)	20.280	4.985		4.068	0.000
Infrastructural support	1.042	0.396	0.271	2.631	0.010*
Administrative support	0.955	0.567	0.173	1.685	0.094

*significant at $p \leq 0.05$.

Abeokuta, which found that the majority of the respondents have integrated ICT resources into their lectures. It is of note that this is a case study and the University in question has no LIS school as at the time of study. This success story should, however, be emulated and/or replicated in all other Nigerian universities. Hence, LIS educators and schools who wish to deliver a current, cutting-edge and quality instruction and 'stand-out' among colleagues and comity of schools are advised to accept, adopt, acquire and promote the skill and use of ESS extensively in teaching practices.

Actual use of ESS for teaching by the LIS educators. It was found that the actual use of ESS for the instructional activities highlighted in the study was below average ($\bar{x}$ =2.25 < 2.5); implying that the use of ESS by the educators for teaching was low. The reason could be that these systems were neither available nor accessible to these educators or that their use for teaching requires technical expertise that needed to be learnt by the educators. It could also be that the use of ESS by the educators for teaching LIS courses is not required or mandated by the management of these universities.

This result supports that of past Nigerian studies, for instance, the survey of Oshinaike and Adekunmisi (2012) on the use of multimedia for teaching which found that the majority of the respondents did not make use of the multimedia resources in practical teaching but rather in forming lecture notes for teaching their students, paper presentations, research and publication activities/outlets. Gombe (2016) researched on the use of ICTs by lecturers in North-Western Nigeria and found low use of ICTs in the classroom by the lecturers, but a significant use for research, accessing mails and word processing. Findings from Ajegbelen's (2016) survey which examined the gap facing the use of ICT in university education with 120 lecturers from five state universities in South-South Nigeria, also revealed that there is a gap between the lecturers and ICT usage in the classrooms.

A Ghanaian study by Obiri-Yeboah et al. (2013) investigated the nature and extent of ICT adoption and use, trend and effect on teaching, research and learning in Kwame Nkrumah University of Science and Technology (KNUST), Kumasi. Data for the study were collected (from 190 respondents: 30 lecturers, 150 students and 10 ICT personnel of different colleges) on the trend of ICT infrastructure for a period of 10 years (2003–2013). It was found that, although there were many technology infrastructures available, they were not fully integrated in teaching, research and learning and that ICTs integration in educational and research processes seems very slow in KNUST.

This finding is also in agreement with some international studies. For example, Gülbahar (2007) in Turkey and Peeraer and Petegem (2011) in Vietnam found some educators who feel they are competent in using educational technology available in the school but are not integrating it into the classroom or using it for teaching. It was found that these educators used a range of ICT applications and computers for lesson preparation, but much less use in classroom teaching. Kumar et al. (2008) pointed out that many Malaysian teachers actively resist using computers even though there are ample research studies that clearly show that achievement and opportunities to learn would increase with the application of technology to teaching. Another study on the barriers to the introduction of ICT in education by Shahadat et al. (2012) found that there is problem of implementation of basic ICTs in education by several higher institutions in Bangladesh. This confirmed the arguments of Barak (2006) who earlier averred that while educators exploit educational technologies for their own learning, they are cautious about integrating technologies in the classroom.

Contrary to this finding, however, are the research studies by Tella et al. (2007) in Nigeria; YuLi (2008) in Taiwan; Bee Theng and Chia Hua (2008) in Malaysia and Hennessy et al.'s (2010) study of Sub-Saharan Africa which found significant use of technology for teaching and emphasized the importance of technology use, especially in exposing educators and their students to a world of information resources.

Administrative and infrastructural support for the use of ESS for teaching. It was found that the LIS educators received minimal administrative and infrastructural supports necessary to teach with ESS ($\bar{x} < 2.5$). This may explain why they were not actually making use of these systems for teaching. For in any institution where necessary infrastructure, technology leadership, mentoring and expertise are lacking, no successful and gainful use of instructional

technology can be made. Little can be achieved with regards to technology use for teaching by educators in an environment where, for instance, there are no electrical and system backups and timely response to system breakdown and where the administrators see the much talked about use of technology for teaching as 'much ado about nothing'. Preliminary investigation revealed that most of the ESS implementations for teaching in the university-based LIS schools were based on individual initiatives rather than government or institutional initiatives.

This finding is in support of the work of Afshari et al. (2010) which identified lack of support by administrators as a significant barrier toward the implementation of technology in classrooms. In line with the finding of minimal administrative support is the report of the World Link Programme, a School ICT Project of the World Bank cited by Hennessy et al. (2010) which found that, though teachers enthusiastically engage in collaborative projects and often portray constructivist pedagogy, school administrators offer very little structural support and few incentives to use the technology effectively in the classroom. The Nwokike and Chiemeka (2011) survey of the Faculty of Education, University of Ibadan, Nigeria also revealed a positive organizational facilitation (that is, adequate support from the university authority) as a factor affecting teachers' use of an online education platform. The study advised university administrators to support their academic staff with necessary infrastructure if they are to successfully exploit online instruction.

Lack of and/or inadequacy of infrastructural support was found by Grainger and Tolhurst (2005) and Hennessy et al. (2010) as a barrier to instructional use of technology. These studies revealed that despite a great deal of recent progress and optimism that many more educators can benefit from access to technology, the infrastructure necessary for deploying technological resources is lacking and many educators are working in conditions that are not conducive to or supporting technology use. Another study by Gulbahar and Guven (2008) reported insufficient technological infrastructure as a factor that had significant effect on the effective use of technology by educators in Turkey. Similarly, Adeosun (2010) in Nigeria found that educators will use technology in teaching if they can pass the hardware/software, connectivity and electrical power supply thresholds. Hence, LIS educators in Nigerian universities need administrative and infrastructural supports to develop and use ESS in order to truly transform teaching and learning.

Hypotheses testing

Administrative and infrastructural support on the actual use of ESS for teaching. It was found that administrative support ($r = 0.337$, $N = 208$, $p = .000$) and infrastructural support ($r = 0.376$, $N = 208$, $p = .000$) correlated with actual use and had significant positive influence. This means that there is a significant and positive relationship between administrative and infrastructural supports and the actual use of ESS for teaching. The result also revealed that administrative and infrastructural supports jointly contributed 14.7% ($Adj.R^2 = 0.147$) to the prediction of actual use of ESS for teaching with a significant and positive joint influence ($F_{(2, 206)} = 19.6457$, $P = .000$). This result implies that the joint contribution of the two independent variables to actual use was significant and that other variables not included in this model might have accounted for the remaining variance. This means that, where administrators give their full support and infrastructural facilities are provided, the use of ESS for teaching among the educators increases.

However, further investigation of the relative contribution of each of the two support factors to the prediction of actual use of ESS for teaching revealed that, although the two contributed positively to the prediction of the use of ESS for teaching, only infrastructural support contributed significantly at alpha ≤ 0.05 (that is, infrastructural support yielded $\beta = 0.271$, $t = 2.631$, $P = 0.010$ while administrative support yielded $\beta = 0.173$, $t = 1.685$, $P = 0.094$).

This result implies that the individual contribution of infrastructural support to the prediction of actual use of ESS for teaching was positive and significant while that of administrative support was also positive but not significant. The interpretation is that while increasing infrastructural support increased significantly the use of ESS for teaching, an increase in administrative support equally led to an increase in the use of ESS but not a significant increase. The implication of this is that administrators' mere lip-service to the use of ESS for teaching, without the provision of corresponding infrastructural support, may not lead to a significant actual use of ESS for teaching by the LIS educators in Nigerian universities.

This finding validated that of Idowu and Esere (2013) which revealed that the attitude of various managements in and outside institutions towards the integration of technology in teaching was rather 'slow' in some instances, and in others there were no aids or support at all. Taking a broader look, however, they insisted that the problem might not be the funds or the technology, but rather the political will on the part of 'governors of education' in Nigeria to fully integrate technology into teaching inspite of all odds. Likewise, Moses et al. (2012) explored the facilitating conditions associated with the laptop use of 412 teachers and found administrative support to have a small but definite relationship with laptop use. In contrast, Demirci (2009) investigated factors affecting Turkish educators' decision to use new technologies in classrooms and found the effect of school administrators' support on the use of new technology significant while Abdo and Semela's (2010) survey on the level of instructional media use among Ethiopian teachers found administrative support on the level of instructional media integration in teaching influential.

Moses et al. (2012) found the relationship between infrastructure and laptop use insignificant as against the finding of this and other research studies, for instance Hennessy et al. (2010) who investigated teacher factors influencing classroom use of technology in Sub-Saharan Africa and found infrastructural support significantly influencing the use of technology. Similarly, Gulbahar and Guven (2008) reported technological infrastructure affecting significantly the effective use of technology by Turkish educators. Moreover, Afshari et al. (2010) listed school infrastructure as one of the factors affecting educators' use of technology in classrooms in Iran. Hence, provision of infrastructural facilities in schools could be an important step in the direction of successful ESS integration. Most of the extant literature reviewed agreed that educators' innovative use of technology for teaching is dependent on the infrastructure on ground and support from administrators.

Summary and conclusion

The study established that administrative and infrastructural support influenced the LIS educators' actual use of ESS for teaching. In the light of the findings therefore, it was concluded that the minimal infrastructural support received by the educators while teaching with ESS explained the low actual use of ESS for teaching. All things being equal, any meaningful infrastructural support given to the educators will result in an appreciable increase in use of ESS for teaching. In addition, administrators' lip-service to the use of ESS for teaching without the provision of commensurate infrastructural facilities will not affect use significantly. Hence, the management of the LIS schools should endeavour to provide their educators with all the support necessary to make gainful use of ESS for teaching.

Implications

For administrative support not to make a significant contribution in predicting LIS educators' actual use of ESS for teaching, as against the findings and conclusions of many past research studies reviewed, could mean that the majority of LIS educators in Nigerian universities were aware and self-directed in their pursuit of using ESS for teaching and that they will use ESS for teaching if the necessary infrastructure can be provided. In other words, they might perceive the usage of ESS for teaching as important for their career self-development and that they might not require the additional 'pull and push' from their administrators to use these instructional resources, once necessary infrastructures are in place. This outcome could perhaps mean good news to policy makers and educational planners in their pursuit of having more educators use ESS for teaching.

Recommendations

In line with the findings of this study, the following recommendations are proffered:

1. To achieve an increased and appreciable use of ESS by the LIS educators for teaching, the educators should be exposed to best practices; available ESS should be installed in the classroom or its vicinity; mentoring, knowledge sharing and peer coaching in the use of ESS for teaching should also be encouraged among the educators; while the use of these systems for teaching should be made compulsory for quality and effective teaching practices and richer learning outcomes.
2. Standard laboratory accommodation with adequate and fully-engaged technical support personnel and sufficient technological resources should be established and/or provided to promote the LIS educators' use of ESS for teaching in Nigerian universities.
3. The Bring-Your-Own-Device (BYOD) strategy could also be explored, whereby educators and their students are encouraged to bring own portable 'techs' and 'apps' to the classroom to be deployed for instructional purposes, bridging any gap in governmental and institutional resource provision.
4. University Management should also provide technological leadership by using, encouraging and financing the instructional use of ESS.
5. Government agencies and ICT production and service organizations could be lobbied by the university administrators to offer free or highly subsidized training and professional development opportunities to educators in order to acquire and develop the requisite skill and expertise in the instructional use of ESS.
6. Realistic and positive policies that encourage a sustainable use of ESS should be put in place and periodically reviewed to allow for any new changes and developments in technological trends and platforms.
7. Reward systems should be instituted to recognise educators that 'stand out' and are making considerable effort in using ESS for teaching to attract more educators into gainful use of ESS for teaching.

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