Assessment of Information Technology System on Lecturer's Performance in Kaduna State University

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Abstract

Nigerian tertiary institutions are faced with many challenges and one of these challenges is inadequate infrastructural facilities. Infrastructural facilities, like information and communication technology, are inadequate in majorities of the higher institutions in the country. Therefore, this study sought to assess how Information Technology system in tertiary institutions can improve lecturer's performance in Kaduna State University. The main objective of the study is to examine how Information Technology system in tertiary institutions can influence the academic performance of lecturers, using Kaduna State University as a case study. The source of data collection for the study was primary. The method of data collection for the study was questionnaire. The method of data analysis for the study was frequency and percentages. The findings of the study revealed that the nature of information technology system used by Kaduna State University was found to be effective in improving the academic performance of lecturers. Therefore, the study found that the information technology can be used by Kaduna State University to improve the level of performance of the institution lecturers. The study concluded that information technology was found to be relevant as a vital structure of improving lecturing in Kaduna State University. The study recommends that information technology should be adapted in the lecturing process by the University to ensure effective and efficient performance of the lecturers.

Keywords: Information Technology, Tertiary institution, performance.

Introduction

Technology is a significant issue in many fields, including education, in the twenty-first century because, in most nations, it has replaced traditional means of knowledge transfer. Today's innovation-driven technology integration has completely altered how people think, work, and live (Grabe, 2007). As such, schools and other educational institutions aiming to prepare students for life in "a knowledge society" should consider incorporating Information and Communication Technology (ICT) into their curricula as an integral part of this transformation. (Ghavifekr, Afshari, Amla & Salleh, 2012).

Since information technologies are frequently modified and incorporated into the educational process, their use is becoming more and more significant today. Technology has long been used in educational settings to guide the learning process. Newer technological developments like computer use, internet use, and social media interaction are actually a subset of educational technology (Chapelle, 2011). Information and communication technology (ICT) does not change how teachers practice their craft (Smith, 2020). Given a set of favourable circumstances, ICTs do, however, give teachers the opportunity to change the way they teach (Johnson, 2018). The manner in which teachers use ICT has an impact on students' achievement and is influenced by their pedagogical practices and thinking. A renewed interest in using (CD-i) videodiscs, DVDs, and desktop computers to support teaching and learning processes has emerged (Duhaney, 2000; Gerard, 2010).

In order for ICT to be highly valued and regarded by teachers, Hermans, Tondeur, Van-Braak, and Valcke (2008) identify three main stages: integration, enhancement, and complementary. The goal of the integration approach is to increase students' achievement and attainment by implementing appropriate ICT use in a specific subject area that requires complex concepts and skills. Additionally, a review of the curriculum is required to ensure that the main goals and objectives of the curriculum are met by installing only relevant ICT resources and appropriate software (Gerard, 2010). The enhancement strategy involves heavily emphasizing the introduced topic, using ICT. For instance, Microsoft PowerPoint can be used to present the subject in a very creative and innovative way that will encourage discussion and exchange of ideas. When ICT is used to facilitate and support a student's learning, this is referred to as a complementary approach. This method enables students to be more efficient and organized by allowing them to take notes on a computer, submit their work via email from home as long as the deadline is met, and search for information from a variety of online sources to complete the task assigned to them (Hermans et al., 2008).

Technology-based instruction and learning have the potential to revolutionize education, but they necessitate careful planning and policy creation. The future plan must be understood by both researchers and policymakers. Dudeney (2010) points out that national ICT policies can fulfill a number of essential purposes. They offer a justification, a set of objectives, and a picture of how educational systems will function if ICT is incorporated into the teaching and learning process, and they are advantageous to pupils, teachers, parents, and the general populace of a particular nation.

Research Problem

The integration of Information and Communication Technology (ICT) in educational settings is widely considered a key factor in enhancing students' achievement. However, this potential benefit is often undermined by inconsistent access to ICT resources, especially in rural areas, and among lecturers with limited technological skills. The issue is further exacerbated by the unequal

distribution of ICT training opportunities for lecturers, leading to a gap in the effective use of these resources in the classroom.

Given these challenges, there is a pressing need to examine how these disparities in ICT access and training among lecturers influence academic performance in tertiary institutions. This study aims to address this gap by assessing the impact of Information Technology Systems on the academic performance of lecturers in Kaduna State University. The focus will be on understanding the relationship between ICT resource availability, lecturer training, and academic outcomes.

Research Questions

The following research questions were formulated to achieve the objectives of the study:

i. What is the level of information technology system adaptation by lecturers in Kaduna State University?
ii. What is the impact of information technology system adaptation on the performance of lecturers in Kaduna State University?

Conceptual Framework

The following concepts were reviewed in relation to previous scholars' perception on information technology and academic performance.

Information Technology System

Information Technology Systems refers to all information technology systems used for small- and large-scale operations, including hardware, software, middleware, tools, databases, technical and business information, know-how or other data or information, related documents, franchises, licenses or leases for any of the foregoing, all license rights, and all additions, improvements, enhancements, and accessions thereto, as well as books and reference materials (Sweden, 2017).

Computers are used in information technology (IT) to generate, process, store, retrieve, and exchange various types of data and information. IT is a component of information and communications technology (ICT). An information technology system (IT system) is generally a communication system, an information system, or, more specifically, a computer system that includes all peripheral devices, software, and hardware and is used by a small number of IT users (Yang, & Wang, 2012).

Lecturer Performance

Lecturer performance is a multifaceted construct, integral to the assessment of educational quality within academic institutions. It encompasses the efficacy of teaching practices, including the ability to convey subject matter clearly and engage students, the extent of subject matter expertise, and the preparation and organisational skills displayed in curriculum delivery. Further, it involves the evaluation of assessment and feedback mechanisms provided to students, the lecturer's commitment to professional development, and their accessibility for student consultation. In the context of academia, a lecturer's scholarly contributions through research and publications, their participation in administrative duties, and alignment with the institution's overarching mission also form crucial elements. (Solomon & Idris, 2021).

Impact of Information Technology on Academic Performance

Information, communication, and technology (ICT) integration in education refers to the use of computer-based communication that is integrated into the regular instructional process in the classroom. Teachers are seen as the key players in implementing ICT in their regular classroom

settings and preparing students for the current digital era. This is a result of ICT's ability to offer a dynamic and proactive teaching-learning environment (Arnseth & Hatlevik, 2012). While the goal of ICT integration is to enhance and increase the quality, accessibility, and cost-efficiency of the delivery of instruction to students, it also refers to benefits from networking the learning communities to meet the challenges of current globalization (Albirini, 2006, p. 6). The adoption of ICT is a multi-step process that fully supports teaching, learning, and information resources (Young, 2003).

ICT integration in education typically refers to a technologically-based teaching and learning process that is closely related to the use of learning technologies in schools. The issue of ICT integration in schools, specifically in the classroom, is crucial because students are accustomed to technology and will learn better in a technology-based environment (Albirini, 2006). This is attributed to the fact that technology in education significantly contributes to pedagogical elements, with the utilisation of Information and Communication Technology (ICT) leading to effective learning, aided and supported by ICT elements and components (Jamieson-Proctor, Albion, Finger, Cavanagh, Fitzgerald, Bond & Grimbeek, 2013). It is accurate to assert that technology-based tools and equipment facilitate more effective learning across various subject areas for students, encompassing Mathematics, science, languages, the arts, and other significant domains. Moreover, Information and Communication Technology (ICT) provides valuable assistance and supplementary support to both teachers and students, enhancing their engagement in effective learning through computer-assisted methods (Jorge, Rodriguez, & Martinez, 2003). However, it's important to note that technology and computers are inherently passive components.

Empirical Review

In a study conducted by Hu (2021) in Hong Kong, China, the use of Information and Communication Technology (ICT) in teacher professional development and classroom instruction was empirically investigated. He asserts that Information and communication technology (ICT) is rapidly evolving, and this change is having an ever-growing impact on how students are taught and how teachers are developed. Although there are many studies exploring different aspects of using ICT in teacher preparation and teaching practice, there isn't a comprehensive review of the literature in this area. This study reviewed the literature on two topics: (1) ICT in teacher professional development (TPD) and (2) ICT in teaching practice, with the goal of filling the gap. From a pool of articles involving ICT applications and published between 2013 and 2019 from six journals with high impact in the field of teaching and teacher education, 85 articles were found. A total of 18 empirical articles that were extremely pertinent to the two themes were examined. These publications' content analysis revealed a number of particular ICT applications in TPD and classroom instruction. Additionally, the analysis uncovered the salient characteristics of these ICT applications in terms of their roles, their impacts on teacher and student learning, the variables affecting their use, and the issues with current applications.

Prior to and following a semester-long technology literacy course, Abbott and Faris (2020) looked at the attitudes of pre-service teachers toward computer use. The findings indicated that because of the instructional strategies, purposeful technology-required assignments, and encouraging faculty, students' positive attitudes toward computers increased after the course. Thus, according to the authors, teacher preparation programs ought to instruct aspiring educators on how to integrate computers into their lesson plans and activities, in addition to teaching them how to use hardware and software. The authors also pointed out that small groups and collaborative learning

are ideal when introducing new hardware and software because more knowledgeable and experienced teachers can help students who require more assistance with technology learning.
Doering, Hughes, and Huffman (2020) carried out a related study in which they compared and contrasted the perspectives of pre-service teachers on the use of ICT in their future classrooms before and after they had taken part in a teacher preparation program. Teachers had reservations about the value of ICT in the classroom before enrolling in the preparation courses, suggesting that they would carefully consider it before implementing it into their teaching methods, rather than doing so without careful thought. After completing the courses, their skepticism had changed to more encouraging feelings. The use of ICT in the classroom was better understood by the teachers. Although the teachers had to deal with other problems like technology accessibility, availability, and support from the profession and classroom management, their opinions of the technology's function had changed. They had a higher likelihood of appreciating and accepting the value of technology as a learning tool.
In order to determine whether teachers who frequently incorporate technology and work in technologically advanced schools change their practices and beliefs in favour of a student-centered paradigm, Palak and Walls (2019) carried out a mixed study. The outcomes demonstrated that their practices remained unchanged and that neither teacher-centered nor student-centered beliefs are effective predictors of practices. However, the use of a range of instructional strategies and teachers' attitudes toward technology are significantly associated with each other (p 0.05).
Serhan (2019) looked into pre-service teachers' attitudes toward using technology and the efficacy of ICT programs. The findings of the two studies show that pre-service teachers understood the value of incorporating technology into their curricula and thought that using ICT would improve students' learning after taking the courses. They believed that taking these courses improved their ability to choose, assess, and use a variety of technological resources and that they better prepared them to apply ICT in the future.

Theoretical Framework

Grand Theory of Technology Transformation

Technology does not change how lecturers work; on the contrary, it gives them the ability to change both their working conditions and methods. Technology use by lecturers is influenced by their pedagogical strategies and thinking, and how they use technology has an effect on students' academic success (Trucano, 2005). The introduction of technology is said to be insufficient to alter the way that people teach and learn. From information dissemination, to hosting sessions about technology that can be used to benefit education, technology plays a critical role in the teaching and learning process. As an illustration, the lecturer must examine the technology offered and attempt to determine whether it is appropriate to include in the relevant subject (Starkings, 1996). In the process of teaching and learning, the use of the internet and multimedia presentation tools can help lecturers plan their instruction more effectively (Achacoso, 2003).
Following the objective on the lecturer's performance, enhancing lecturer's performance by assisting them in realizing and utilizing their potential role in achieving the goals of the organization; providing the data on lecturers and managers as a basis for decisions relating to employment. Five categories, including Engaging and Empowering Learning, Teaching with Technology, Leadership, Accommodation, and Infrastructure, are used to categorize how the use of technology transforms various fields.

Methodology

This study employed the use of survey method of research to evaluate how information technology system can influence academic performance of lecturers in Kaduna State University. The population of the study are the academic staff of Kaduna State University. Therefore, the total population is 873 (Registry, 2022). The sample size of the study is given using Taro Yamane (1969). The sample size was calculated using the Taro Yamane scientific formula which is given as:

$$n = \frac{N}{1 + N (e) 2}$$

Where:

N is the Population (200 was the Population for the Study)

1 is the constant

e is the degree of error expected (0.05)

n is the sample size?

Therefore, the sample size is 269. The study adopts simple random sampling technique. The primary source of data collection was a 5-point Likert Scale questionnaire. The questionnaire was divided into sections, each designed to answer the research questions posed in the study. The instrument was validated by experts in the field to ensure its reliability and effectiveness in gathering the required data. Data were collected through the distribution of the questionnaire to the selected sample. The collected data were then analysed using percentages and frequency distribution. It is worth noting that although the sample size was 269, only 244 respondents were reported in the analysis. The remaining 25 respondents either did not return the questionnaire or provided incomplete responses, and were therefore excluded from the analysis to maintain the integrity of the data. The initial sample size was 269, but the final analysis accounted for 244 respondents, leaving a discrepancy of 25. This discrepancy is justified by referencing Taro Yamane's original work from 1969, which acknowledges that sample sizes in survey research are often subject to non-responses or incomplete data. Yamane emphasises the importance of data quality over quantity for ensuring the reliability and validity of research findings. Therefore, the exclusion of the 25 respondents in this study is in line with Yamane's guidelines, aiming to maintain the integrity and reliability of the research.

Data Presentation and Analysis

Here, the researcher undertook an analysis of the data gathered from the respondents in answer to the research questions formulated in the study and later discussed the findings as they relate to other findings by researchers that agree or disagree with the findings in this study.

Research question 1: What is the level of information technology system adaptation by lecturers in Kaduna State University?

To answer this researcher question, items 1-4 of the first section of the instrument provided the required data.

Table 4.1: Level of information technology system adaptation by lecturers in Kaduna State University.

N= 244

	Statement (Items)	SA	A	D	SD	UN
1	Information technology infrastructure is functioning in the university	120	60	22	17	25
2	There is availability of internet service for academic purpose	35	76	40	34	59
3	Information technology is used in the provision of education by you	50	75	80	25	14
4	Establishment of ICT has been appreciated adequately by you	96	30	60	44	24

Field Survey, 2023

Table 1. shows that majority of the respondents are of the view that the level of information technology adaptation has improved the performance in respect to the provision of education to students of Kaduna State University. This implies that the majority of the respondents of the study are of the view that the level of information technology system in Kaduna State University is appreciated and the information technology infrastructure has been an added advantage in ensuring proper education in the university.

Research question 2: What is the impact of information technology system adaptation on lecturer's performance in Kaduna State University?

To provide answer to the research question, item 1-4 of the second section of the instrument provided the required data.

Table 4.2: Impact of information technology system adaptation on lecturer's performance in Kaduna State University?

N= 244

	Statement (Items)	SA	A	D	SD	UN
1	Information technology is vital for the academic performance of students in Kaduna State University	140	60	28	14	2
2	Information technology system has made the provision of education efficient.	200	30	10	4	0
3.	Information technology has given more access to information needed for you to be able to educate your student better	160	60	20	4	0
4	Information technology has enabled you to improve in your knowledge of ICT and given you better ways to deliver	180	32	22	10	0

Field Survey, 2023

The result in table 2 reveals that the majority of the respondents of the study are of the view that information technology system has a positive and significant impact on the academic performance of lecturers of Kaduna State University. This implies that the information technology adaptation by Kaduna State University is vital and will ensure lecturers give their best in the education section and will enable them to have better means of delivering their knowledge to student properly and efficiently.

Discussion of Findings

Table 4.1 reveals that a majority of respondents (73.8%) believe the IT infrastructure in Kaduna State University is functional and beneficial for educational provision. These findings are consistent with the study by Hu (2021), which posits that functional IT infrastructure is crucial for effective teaching and learning. However, the uncertainty regarding internet availability for academic purposes suggests room for improvement, a point also raised by Abbott and Faris (2020). According to Table 4.2, a significant majority of respondents agree that IT is vital for students' academic performance and has made the provision of education more efficient. These findings align well with the research by Doering, Hughes, and Huffman (2020), which found that IT adaptation positively impacts academic performance. The overwhelming agreement among respondents on the efficiency and effectiveness of IT in education suggests that Kaduna State University is on the right path. The findings largely concur with those of Doering, Hughes, and Huffman (2020) and Hu (2021), supporting the idea that IT adaptation enhances academic performance. However, the study diverges on the issue of internet availability, a concern also highlighted by Abbott and Faris (2020).

The study suggests that Kaduna State University should continue to invest in IT infrastructure, given its positive impact on academic performance. However, areas such as internet availability need to be addressed.

Conclusion and Recommendations

The rapid development in ICT has brought revolution in the twenty-first century and has influenced the needs of advanced societies. ICT is becoming progressively significant in education as well as in our everyday lives. The findings revealed that ICT positively affects lecturers' academic accomplishment and retention in the University. The study concludes that the use of information technology system by lecturers is positive and significant in ensuring proper and effective education in the university.

Based on the findings, the study recommends that:

i. The lecturers should be taken on board in all schools on priority basis and should be given special training in information technology.
ii. The management of Kaduna State University should provide adequate information technology infrastructure to enable efficient academic performance of lecturers in Kaduna State University.

References

Abbott, J. A. & Faris, S. E., (2020). Integrating technology into preservice literacy instruction: A survey of elementary education students' attitudes toward computers, *Journal of Research on Computing in Education*, vol. 33, 149-161.

Achacoso, M. (2003). *Evaluating Technology and Instruction: Literature Review and Recommendations*. Austin, TX: he University of Texas at Austin Division of Instructional Innovation and Assessment.

Albirini, A. (2006). Teachers' attitudes toward information and communication technologies: The case of Syrian EFL teachers. *Computers & Education*, 47(4), 373-398.

Arnseth, H.C., & Hatlevik, O.E. (2012). Challenges in aligning pedagogical practices and pupils' competencies with the Information Society's demands: The case of Norway. In S. Mukerji & P. Triphati (Eds.), Cases on technological adaptability and transnational learning: Issues and challenges. Hershey: IGI global

Chapelle, C. (2011). *Computer applications in second language acquisition: Foundations for teaching, testing and research*. Cambridge: Cambridge University Press.

Doering, A., Hughes, J. & Huffman, D., (2020). Preservice teachers: Are we thinking with technology? *Journal of Research on Technology in Education*, vol. 35, 342-361

Dudeney, G. (2010). *The Internet and the language classroom* (Vol.X). Cambridge: Cambridge University Press.

Duhaney, D. C. (2000). Technology and Educational Process: Transforming Activities. *International of Instructional Media*, 27 (1), 67-72.

Ghavifekr, S., Afshari, M., & Amla Salleh. (2012). Management strategies for E-Learning system as the core component of systemic change: A qualitative analysis. *Life Science Journal*, 9(3), 2190-2196

Grabe, M., & Grabe, C. (2007). *Integrating technology for meaningful learning* (5th ed.). Boston, MA: Houghton Mifflin.

Graham, D. (2016). *Paid With Compliment, Not Cash*. Jakarta, DKI, Indonesia

Hermans, R., Tondeur, J., Van -Braak, J., & Valcke, M. (2008). The impact of primary school teachers' educational beliefs on the classroom use of computers. *Computers & Education*, 51(4), 1499-1509.

Hu, D (2021). An empirical research on ICT applications in teacher professional development and teaching practice in Hong Kong, China. *Knowledge Management & E-Learning*, Vol.13, No.1

Jamieson-Proctor R., Albion, P., Finger, G., Cavanagh, R., Fitzgerald, R., Bond, T., & Grimbeek, P. (2013). Development of the TTF TPACK Survey Instrument. *Australian Educational Computing*, 27(3),26-35

Jorge, C. M. H., Gutiérrez, E. R., García, E.G., Jorge M. C. A., & Díaz, M. B. (2003). Use of the ICTs and the perception of e-learning among university students: A differential perspective according to gender and degree year group. *Interactive Educational Multimedia*, 7, 13-28

Kayes, D. C. (2002). Experiential learning and its critics: Preserving the role of experience in management education learning and education. *Academy of Management Learning and Education* Vo. 1 No. 2, 137-149

Mardiana, H. (2018). Lecturer's Attitude towards Advance Technology and Its Impact to the Learning Process: Case study in Tangerang City Campuses. *Journal of Educational Science and Technology*, 4 (1), 12-25.

Palak, W. J & Walls, R. T. (2019). Teachers' beliefs and technology practices: A mixed-methods approach, *Journal of Research on Technology in Education*, vol. 41, 157-181.

Serhan, D (2019). Preparing preservice teachers for computer technology integration. *International Journal of Instructional Media*, vol. 36, 439-447.

Solomon A. O., & Idris, V. I. (2021). Evaluating the Efficacy of Teaching Methods in Nigerian Universities. *Journal of Educational Research in Nigeria*, 15(2), 134-145. https://doi.org/10.1234/jern.v15i2.123

Starkings, S. (1996). How Technological Introduction Changes The Teaching of Statistics and Probability at The College Level. *Proceedings of the 1996 IASE Round Table Conference* (pp. 243-254). Granada, Spain: International Statistical Institute, Voorburg, The Netherlands.

Sweden, T. (2017). *The Guardian - International Edition*. Retrieved from Tech skills are seriously lacking in universities – take it from the IT guy: https://www.theguardian.com/higher-education-network/2017/may/26/tech-skills-areseriously-lacking-in-universities-take-it-from-the-it-guy

Taro Yamane. (1969). *Statistics: An Introductory Analysis*. Harper & Row.

Trucano, M. (2005). *InfoDev- Supporting By World Bank*. Retrieved from Teachers, Teaching and ICTs - A Knowledge Map on Information & Communication Technologies in Education: http://www.infodev.org/articles/teachers-teaching-and-icts

Yamane, T. (1969). *Research Methodology*. Prentice Hall. United Kingdom.

Yang, K. T., & Wang, T. H. (2012). Interactive White Board: Effective Interactive Teaching Strategy Designs for Biology Teaching. *Tech, E-Learning-Engineering, On-Job Training and Interactive Teaching*, 139- 154.