

The Role of Information Technology for Quality Education in Nigerian Universities

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Abstract— This paper explore the relationship between Information Technology (IT) and its role with regards to quality of education in the Nigerian universities. It firstly elaborated what IT entails and the standards for defining global quality in education. The research went on to identify the cutting edge technologies that are transforming the standard quality in education in the contemporary society as one of the means for establishing the research confines. In addition, the paper elucidated the different categories of university systems in Nigeria and provided accurate statistics of the respective categories. A review of related literatures was meticulously conducted with the aim of unveiling what aspect of research interest were there to be explored and eventually two research hypothesis were outlined and researched on. The first hypothesis tested for the availability of IT presence in the Nigerian universities, and depending on the outcome of the first hypothesis result, the research on the second hypothesis took effect. The second hypothesis ascertained to what extend is the role of IT to quality education in Nigerian universities. The research used an online questionnaire as the research instrument facilitated by google form organized around complex random sampling technique adopting both clustered sampling and stratified sampling techniques for data collection. Subsequently, the latest version of Statistical Package for the Social Sciences (SPSS) was deployed for the analysis of the collected data; specifically IBM SPSS V26 was used invoking both descriptive statistics and two tailed partial correlation in arriving at the responses to the research hypotheses. The results obtained showed a great presence of state of the art information technology gadgets in the Nigerian University, but there is apparent inappropriateness of applications of the IT tools. Nevertheless the result also showed that there is remarkable relationship between the application of IT tools in teaching and learning in Nigerian Universities and the increase in the standard of quality education. Further, recommendations were provided on how to improve the quality of Nigerian university educational system from the established conclusions.

Index Terms— Education, Information Technology, Nigerian Universities, Quality. .

I. INTRODUCTION

Information Technology (IT) is perceived as the means of treating and dispersing data through the use of computer systems, mobile technologies, and digital electronics. In other wards Information technology connotes digital electronic supported platform that provides a repository and access to information. Therefore, Information Communication

Technology (ICT) constitute the entirety of telecommunication technology gadgets needed to maintain information and ensure standards for making it handy and usable, hence it entails the consideration for standard procedures for acquiring, processing, manipulation and its permeation across the contemporary information driven society.

The application of ICT facilitated the integration of a gamut of digitized media in a single repository that could be reliably transmitted across a common medium simultaneously through different frequencies that guarantees noninterference of one media data by another [8]. This means media data comprising of spatial data, graphics, text, and sound can be conveniently carried to a destination along a common medium and data integrity will still be maintained eventually.

It was further affirmed that, the increase in the proliferation of Information Communication Technology in the Nigerian institutions of learning will witness an immense growth in proportion with the rapid technological advancement [7].

This certainly reveals a promising huge potential harnessing in the aspects of economic opportunities, human resource development and socio cultural exploration and diversification which are key components in the heart of quality educational system. Technology advances at an exponential rate thereby posing some challenges to the Nigerian higher education stakeholders in keeping up with the proficiency in maximizing its full potentials hence the advantages of these technologies in achieving quality education is not commiserate with the level of investment put into it relative to other sectors that harnesses ICT in Nigeria such as telecommunication [15].

Conversely, there is a direct benefit of telecommunication in actualizing prominent mechanism of quality education for its tremendous impact on teaching, learning, research and managerial purposes in higher education in Nigeria [4]. Further, the possibilities that surround the adoption of ICT in the teaching and learning are so vast. ICT in Nigerian Universities will enhance, amplify, and broaden skills, it will incentivize and add pleasure to learning as well as help students to direct school trainings to proffer solutions to real world problems.

Quality education connotes the association of reputable teachers with estimable personality impacting on learners in an organized school setting [2]. If quality appraisal creates skepticism in academics as experts, and compromises high standard of subject knowledge to promote students contentment, and if quality appraisal perpetually revolves around the same criterion of measurement all the times as a

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predetermined standard, this then goes to say that quality evaluation is exhausted and there is nothing more to be assessed, or too much has been measured [9]. Therefore, the essence of quality may culminate in a circus or loop if allowed to be guided or controlled exclusively for management reasons, as academics will be reduced to adherence to only predetermined standards and performance indicators that deprive academics the liberty of introducing qualities that may trigger the true potentials and values in the learners.

Quality is attainable when it is applied positively as leverage to particular academics to improve student's tenacity to learning and teaching, albeit adhering to stringent laid down path on paper. The current perception of quality in Nigerian University system is not working with the obvious strict adherence to spelled out standards and mechanism of assessment, which when met, it will then be presumed that the educational system works well regardless of what opportunity cost went underneath undiscovered [13]. For this, Nigerian universities should promote the actualization of quality in positive learning and teaching as "magic glue" so long as it gives room for originality of purpose.

A rating document on tertiary education in Nigeria asserted that deliberate actions in tertiary education system during successive governance of military leaders have disoriented and hinder the attainment of desired quality in higher education in Nigeria [18]. In a bid to transform the standard of higher education in Nigeria, the National University Commission (NUC) of Nigeria was instituted as a government regulatory body charged with the responsibility of enhancing quality in university education in Nigeria. This body is equally concerned with the approval of all programmes and the creation of degree awarding institutions learning in Nigeria. Nigerian universities comprise in general, the combination of both public and private universities [14].

NUC reported on its online platform that Nigeria in the current year has up to one hundred and seventy four (174) recognized universities, forty three (43) out of which are Federal Universities, fifty two (52) are State Universities and the remaining seventy nine (79) are private universities [16].

Indicators of quality education are broadly captured by [9] as follows: openness to learning, academic performance level, self-trust, employability, and enabling inputs.

A wide range of information technology tools are integrated into the art of teaching and learning at various levels of education. The most commonly used IT tools in Nigerian Universities to improve the quality of education includes, but not limited to the followings: Video Tapes, Television, Multimedia Projectors, Interactive white boards, Internet, Google Doc, Computer Systems, and Presentation applications [2].

II. RELATED LITERATURE

Traditional instructional processes are no longer suitable in equipping the students to fit purpose for value in the contemporary world workforce especially at the tertiary education level, the computer has revolutionized the way higher institutions conduct their core mandates such as

knowledge generation, dissemination and management [3]. ICT developed human mental resources, which allow people to both successfully apply the existing knowledge and produce new knowledge [1]. This new development is strong indication that the era of teachers without ICT skills are gone, higher education institutions should be highly computerized, and all lecturers should be able to use ICT facilities to enhance their working methods [12].

In Nigerian educational system, ICT has helped to increase access to and improving the relevance and the quality of education. It greatly facilitates the acquisition and absorption of knowledge, offering developing countries unprecedented opportunities to enhance educational systems, improve policy formulation and execution. Furthermore, ICT has enhanced access to remote learning resources. Teachers and learners no longer have to rely solely on physical media housed in libraries (and available in limited quantities) for their educational needs [4].

However, acquisition, deployment and management of information technology resources and services for teaching depend on electricity. Studies have shown that poorly maintained equipment and poor network infrastructure are prominent obstacles to the integration of ICT tools in teaching. Poor technical equipment would make negative impact on teacher's desire to integrate ICT tools in teaching all other courses. Technological and science laboratories are run using electricity. Computers cannot operate without electricity even if all the equipment required are present. A number of teachers today have never use computers in their lives and they are terribly shy when they are confronted with this new technology and the terminology associated with using them [17]. Some schools do not have them provided for their teachers and some teachers may not be economically buoyant to buy one for themselves. At the tertiary-level of education, National Universities Commission (NUC) in Nigeria has prescribed that there should be at least one computer to every four students and one PC to every two lecturers below the grade of lecturer I, one PC per senior lecturer and one notebook per reader/ professor. NUC has gone further to establish e-learning platforms fitted with twenty smart boards in twelve Federal universities for the promotion of the use of ICT in teaching and learning. Majority of the Nigerian universities have not achieved this recommended system ratio for their faculties, though some have made giant or notable strides in campus wide area networking and e-learning course deliveries. Institutions like Obafemi Awolowo University (OAU) and University of Nigeria, Nsukka boast of its best-developed ICT system in the country with a personal Very Small Aperture Terminal (VSAT) access to the internet and a campus wide intranet services. University of Jos which is blazing the trail for content development and e-learning in addition to the campus networking [5].

Very few of public higher institutions in the country are capable of meeting the ICT needs of their staff and students. The question now is what happens to the rest institutions? Many university lecturers and students have to go to commercial cyber cafés in town before they have access to a computer that is internet connected or at best buy private

modems with which they are able to connect to the internet. The private universities seem to be better off since majority of them like Covenant University (CU), Afe Babalola University, American University of Nigeria (AAUN), etc have 24-hour internet connectivity in their campuses but the population of lecturers and students compared to public universities are few. At AAUN for instance, each student is provided a laptop with the cost factored into the fee structure. That of course will not be within the reach of many students [10].

To mitigate this, Nigerian education system put in place policies such as making the use of IT mandatory at all levels of educational institutions through adequate financial provision for tools and resources; developing relevant IT curricula for the primary, secondary and tertiary institutions; A virtual university system shall be established; encouraging IT companies with appropriate incentives to compel them to invest in education and training through certification for tax rebates through existing government bodies experienced in such matters such as the Industrial Training Fund (ITF) and Centre for Management Development (CMD) [15].

It is for reason such as this that the long standing ‘psychological contract’ in which the academic profession was relatively free to govern its own academic affairs, whilst state regulation took care of non-academic matters, has been severely disrupted by a rise in new managerial approaches to university governance. The latter for a long time was held between a strong state and a strong profession. Now, in the public sectors of many European countries, top-down regulation and control have been displaced by government ‘steering at a distance. In these changed modes of governance higher education institutions gain new autonomy but at the price of increased accountability and quality checks [10].

In lower income countries, sites for practice-based education, like hospitals and health centers in human services professions, can be desperately under-resourced, lacking even basic equipment, let alone advanced technologies that would be routinely available in developed nations. The advantages of modern ICT tools, including software for business and accounting applications, may simply not be available to students [19], which partly is the case with most Nigerian universities.

III. RESEARCH APPROACH

The research aims at addressing two research hypotheses, the first being to ascertain the level of availability of information technology facilities in Nigerian universities. Secondly, to establish to what extent is the role of information technology in enhancing the quality of education in Nigerian universities. Hence, the target universe or population comprised of students currently undertaking different degree and diploma courses in the 174 universities across Nigeria, plus those who have acquired any level of certificate from any recognized university within Nigeria.

To ensure validity of research outcome, this research followed a complex random sampling technique adopting both clustered sampling and stratified sampling techniques. The clustered sampling was employed to elicit the views of

multiple online academic groups made up of scholars drawn from disparate universities across the country in order to minimize bias and maximize reliability of data collected. The stratified sampling was useful in identifying the different levels of academic pursuits of the respondents which ensured that all levels are captured to reflect a balanced account of opinion poll starting from the undergraduate point to the highest level of degree awarded by the Nigerian universities. This helps in minimizing bias and improving the reliability of the collected data.

An online questionnaire implemented by way of google-doc form was used as the research or data collection instrument. The questionnaire was made up of thirty (30) questions in all. In enhancing data quality control, two (2) highly reputable research experts, one from the faculty of military sciences Nigerian Defense Academy (NDA), in Kaduna state and another from the faculty of natural sciences university of Jos, Plateau state were consulted to critically assess and rate the validity of the questions. Hence the outcome of the rating produced a strong research instrument with a Content Validity Index (CVI) of 0.9 as computed in the table 3.1.

Table 3.1 Questionnaire Content Validity Index Rating

Consultants	Questions		Total
	Relevant	Irrelevant	
Consultant 1	26	4	30
Consultant 2	28	2	30
	54	6	60

Agreed questions by both consultants as standard

$$CVI = \frac{\text{Total number of questions being assessed}}{\text{Total number of questions}} [11]$$

$$CVI = \frac{54}{60} = 0.9$$

A. Procedure and Analysis

Out of the thirty questions presented, 25 were framed around the Information Technology gadgets used in the respective universities of the respondents using a Likert-scale response options coded as 1=strongly disagree, 2=disagree, 3=agree consecutively to 4=strongly agree. This is because it has been justified that smartphone software and the global network of computers are constantly improving the rate of student’s change in behavior and scalability within educational system [6]. The acceleration in change in behaviors is attributed to the seamless nature of the technologically enhanced content upgrading, knowledge ownership, information access and sharing in conformity with international best practice.

A total of one hundred and fifty (150) respondents views were gotten from the online survey conducted and the summary of the technologies with regards to the devices deployed in the various Nigerian universities of the respondents are as presented by the bar charts in Figure 3.1.

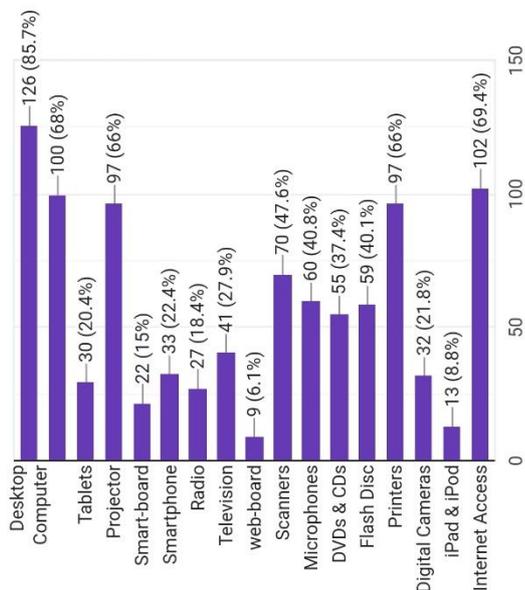


Figure 3.1: Summary of Hardware Used in Nigerian Universities

To respond to the two stated research hypothesis, a statistical analytic tool specifically, the Statistical Package for the Social Sciences (SPSS) version 26 was used to generate charts and also run a two tailed partial correlation to test the significance of the relationship between the use of information technology in the Nigerian universities and the resultant quality in its application.

IV. RESULTS AND DISCUSSION

To answer the first hypothesis which is to prove whether there is the availability of information technology tools in use in the Nigerian university. Figure 3.1 is sufficient enough to

Table 4.1 Institution Applied the Right Technology in the Right Area

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	4	2.7	2.7	2.7
Agree	61	40.7	40.7	43.3
Disagree	59	39.3	39.3	82.7
Strongly Agree	12	8.0	8.0	90.7
Strongly Disagree	14	9.3	9.3	100.0
Total	150	100.0	100.0	

provide such details with the reflection of the different percentages of the numerous technologies deployed in the universities across the country. The technology with the highest percentage as depicted from the summary of the opinion polls of the respondents being Desktop computer has 85.7% followed by internet access with a percentage of 69.4%. Conversely, towards the bottom of the chart, the least obviously is the web-board with the percentage of 6.1%, this no doubt a clear reflection of the Nigerian educational system. Web-boards are meant to provide efficient and effective means for students to have access to course materials, announcements and instructions regarding a module with ease, and in turn submit deliverables in softcopies at various due dates. This additionally provide an avenue for students to own a central university accounts, where both semester and sessional results are uploaded for student’s consumption before main certificates are printed for final collection. However, web-boards are not so common in Nigerian universities and the few universities that operate such services do not provide it adequately and consistently. Further, the next technology at the bottom of the usage rating is the iPad and iPod, which of course is justifiable for its high economic cost, at the upper lowest level with the percentage usage of 8.8%.

Therefore it is reliably established here, that there is a remarkable availability of information technology application in the Nigerian university system.

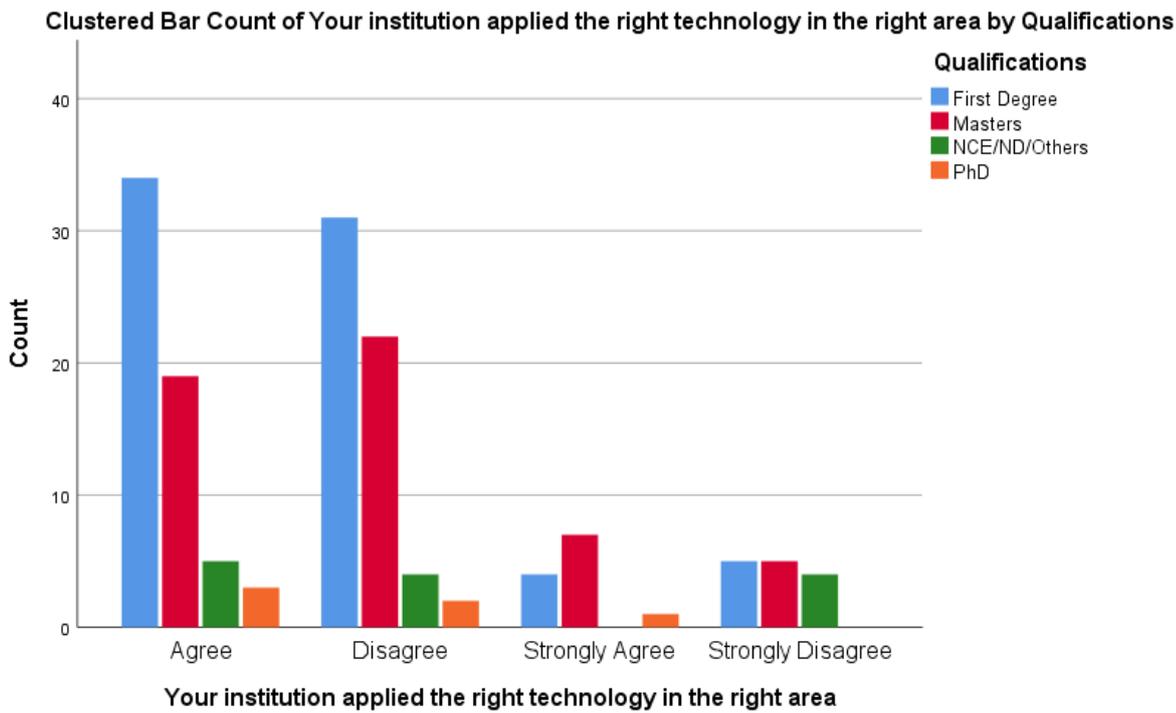


Figure 4.1: Effectiveness of Technology Application in Nigerian Universities

However, a section of the finding revealed a negative position as to whether those technologies are appropriately applied for the right purposes. This leaves a lot of questions to be asked regarding the proficiency of the university lecturers in handling the educational technologies at their disposal. Deducing from Table 4.1, there is a negligible average margin of 1.35% between the percentage that shows effective use of the available technology and its inappropriate deployment in the Nigerian universities. This setback can severely militate against the set goal of achieving optimal quality in education sector. Hence the need for training of the affected educational

stakeholders to overcome this menace and reap its full benefits.

This claim is further substantiated by the bar chart in figure 4.1, a breakdown of sample of products of Nigerian universities who held either a first degree, master’s degree, doctorate of philosophy and other kinds of certificates, attested to the fact that having the educational technology is one thing and putting it into the right use is another challenge that calls for concerted effort if quality is to be harnessed in educational sector.

Table 4.1: Two Tailed Partial Correlations Analysis Result

Control Variables			Info Tech Makes Edu More Efficient & Effective	Info Tech Helps Students Build More Successful Career	Info Tech Contribute Positively in Pedagogical Standards
Respondents with Degrees from Nigerian Universities	Info Tech Makes Edu More Efficient & Effective	Correlation	1.000	.637	.403
		Significance (2-tailed)	.	.000	.000
		df	0	147	147
	Info Tech Helps Students Build More Successful Career	Correlation	.637	1.000	.728
		Significance (2-tailed)	.000	.	.000
		df	147	0	147
	Info Tech Contribute Positively in Pedagogical Standards	Correlation	.403	.728	1.000
		Significance (2-tailed)	.000	.000	.
		df	147	147	0

Responding to the second hypothesis, which is to establish to what extent is the role of information technology in enhancing the quality of education in Nigerian universities. Addressing this research hypothesis reliably, a two tailed partial correlation analysis was ran using IBM SPSS V26 to check the significance in relationships among the data collected under the parameters captioned as; (i) Info tech makes education more efficient & effective, (ii) Info tech helps students build more successful career, and (iii) Info tech contribute positively in pedagogical standards using the data collected under the respondents with degrees from Nigerian universities as the controlled variable appeared very suitable as presented in the result of the analysis in table 4.1.

The results followed an interesting and convincing regular pattern that depicts very strong positive relationships among the parameters considered. The correlation coefficient between the parameters are; (i and ii =.637), (i and iii=.403) and (ii and iii=.728) on a scale of 1.00. The hermeneutic perception of this result suggested a colossal positive correlation among the three parameters with zero level discrepancy significance. Therefore the result as shown by the analyzed data collected proved that even though to a large extent the available technology is not applied in the right areas in Nigerian university education, however when it is rightly applied information technology enhances the quality of education which is substantiated by career throughput and the impact in learning outcomes.

V. RECOMMENDATIONS AND CONCLUSION

A. Conclusion

At this point, the two earlier hypothesis stated have been empirically proven and the results showed that a great number of state of the art information technology gadgets such as Desktop computers, Laptop computers, Tablets, projectors, Smart phones, Radios, Televisions, Web-boards, Scanners, Microphones, Digital Video Display DVD's and Compact Discs CD, Flash discs, printers, Digital Cameras, iPad/iPod, and internet the list of which is not exhaustive are deployed for used in the Nigerian universities for the advancement of the quality of education. Besides that, the outcome of the research analysis also indicated that the presence of these technologies in Nigerian universities is not enough, but of major concern is putting the technologies into their appropriate use for the right purposes. In addition, the result of the partial correlation analysis succinctly asserts the proportional relationship between the use of information technology in the Nigerian universities and the resultant enhancement in quality of education as against the traditional teaching approaches. Therefore, the use of information technology has a significant positive effect on the quality of education.

B. Recommendations

Based on the preceding affirmed results of the proven hypothesis, the following recommendations were proffered:

- i. The Nigerian government should ensure the proliferation of information technology facilities in its universities where such technologies are not found.
- ii. Technologies such as smart-boards and web-board

which are not so common in the universities should be injected into the mainstream of the Nigerian universities.

- iii. Workshops, seminars and advance training in the use of information technology gadgets should be promoted among the university lecturers periodically so as to leverage the maximum benefits of the available technology and the investments therein.
- iv. Government can partner with international communities to promote collaborative research and innovations partnership through e-learning platforms.
- v. Internet access is extremely indispensable in the promotion of quality in education; therefore government should ensure bandwidth affordability and access through subsidized partnership with the Nigerian universities.

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