The Role of Information and Communication Technology (ICT) in the Academic Performance of the University of Benin Post Graduate Students

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Authors' contributions

This work was carried out in collaboration among all authors. Author MSUO structured the study, directed the statistical analysis, overhaul the study and wrote the manuscript. Author DEA managed the analyses of the study. Wrote the manuscript and managed the literature searches. All authors read and approved the final manuscript.

Article Information

Short Research Article

Abstract

Student performance has several elements, but most significant is the role the information and communication technology plays. The performance of students in modern education is quite different from the traditional method used over the past decades. ICT is a revolution and has indeed bridged the divided world of information into single entity; it has further enhanced the resourcefulness of students in various academic institutions around the globe. This study is a fact finding into the role of ICT as it relates to students performance in modern education and the traditional method of research in time past. University of Benin (Uniben) Post Graduate Students were used to solicit information required for the research decision. From the findings, it was observed that there is a significant difference between the users and non users of ICT facilities on academic activities. Tables 1, 2, 3 and 4 as tabulated below shows

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the positive impact of ICT on student performance. The testing, t-test was 1.96 at 0.05 significance level, while the t-value was 4.677 and this to a large degree shows clear distinction to viability of the impact of ICT on the positive performance on students.

1 Introduction

In recent times, Information and Communication Technology (ICT) has changed the scope of learning. Just recently, the call for the role of ICT in student performance has become an extensive debate by both academia and information technology (IT) personnel. The last decades has seen a shift from the traditional method of learning to more digitalized method and these are seen from the ICT penetration in recent times. Research into ICT role has unveiled the added value in classroom activities as well as student performance. Some literatures have looked at the impact of computer usage. However, since the internet revolution, there have been literatures on its impact in online activities and this includes the educative online platforms, digital devices, use of blogs, wikis, games, social media etc. From empirical studies, some of the literatures are divergent in opinion as well as the propounded theories. While some literatures showed that there is no evidence of the key role for ICT in higher education, others showed a real impact of ICT on student s' performance [1,2,3,4,5,6,7].

Empirically, the academic field is becoming more demanding in modern society. As knowledge expands in scope and size, modern technologies placed a huge body on the deployment of Information and Communication Technology (ICT) in learning. ICT creates opportunities for communication within and outside academics and also, it creates new approach for learning. The day to day usage of ICT facilities creates the enable environment to acquiring the needed skills that facilitates learning and other social benefits. ICT is an important tool for promoting inclusive learning [8]. Access to ICT within academic institution is the gate way to the availability of scholarly materials in an institution [9]. However, not only does ICT saves time the endless benefits it provides to managing cost, speed processing, distance learning possibility, students assessment achievement, and the administration of examination via Computer based Test (CBT) cannot be under estimated [10].

The sections are arranged as follows: Section one is the introduction, section two reviewed ICT as a change agent, section three looked at ICT and the academic staff, section four examined the role of academic institution and ICT, section five elucidated on the research approach while section six discussed the result findings. Section seven is the conclusion remarks.

2 Related Work

The advent of ICT has showed within a short time how ICT has become one of the blocks of a modern society education. This in many ways has made some countries now regarded as ICT giant a change agent in modern education and ICT has created a basic for mastering its basic concepts as part of the core purpose of education [11]. The emergence of ICT has indeed transformed the activities of its end users as well as setting up standard for globalization. According to [12], the introduction of ICT into secondary school curriculum in India improved student's performance in chemistry. In recent times, there has been overwhelming support locally and internationally for the use of ICT in learning activities [13].

Defines ICT as a collection of technical devices and resources which are use to transmit, store, manage information [14]. The literature also explained that the utilization of ICT as instructive process has been partitioned into two classification:

(i) ICT for Education: This involves the development of ICT particularly for teaching and learning purpose.

(ii) ICT in Education: this is the adoption of ICT in the instructional process [13].

Various studies from empirical analysis have showed a constant increase in sophisticated and enabling technologies. Hence, technological literacy is a must requirement for all purposes. The increase in the growth of ICT is directly proportional to the life style of modern society children. Furthermore, 21st century has witnessed exponential growth/impact in Information and Communication Technology (ICT). This period has helped to bridge the divided world into one single entity, thereby leading to experience disposition to economizing the academics achievement of Lecturers and students. ICT resources in teaching and learning environment have found to be very central to information access, spreading and dissemination of educational data.

According to [15,16], internet is a worldwide system of computer networks, a network of network in which users at any computer can, if given the permission to access from any other computer (and sometimes talk directly to user at other computers). The Advanced Research Project Agency Network (ARPANet) in 1969 by the US Department of Defense came up with the internet and this was attributed to military intelligence and research [17]. Internet is regarded as one of the major revolutions in ICT and has affected the world positively. Though, it has its negative side but the positive sides outweigh the drawback associated with it. In 1973 the protocol suit was developed for use and the outcome of the research effort gave birth to what is known as Transmission Control Protocol/Internet Protocol (TCP/IP) [16].

[18] Made known that the internet penetration got to Nigeria in 1991 when the e-mail services of the internet was introduced through dial- up. Then, access to the internet was through Cyber Cafés connected to Internet Service Provider (ISPs). As captured by [17], in 1995 the Regional Information Network for Africa (RINAF) commenced internet services at the Computer Science Department of Yaba College of Technology and this was through the Nigeria Postal Service (NIPOST) in collaborative effort with Rose Clayton Nigeria Limited. The World Wide Web (WWW) became available in 1996 and its full access became obvious in 1998. From what the ICT offers, it is a known fact that all universities around the globe are connected to the internet for the sole purpose of research, information dissemination and adding to the knowledge base of the society as well as creating up to date information. ICT is a term for information and communication technology, the technology is the integration of telecommunications (telephone lines and wireless signals), computers and other necessary enterprise software that drives it.

3 The ICT and Academic Staff

The performance of academics is centered on research breakthrough and several elements contributed to the breakthrough measurement. The measurement of literature includes experience from workshops, conferences attended and scholarly work from well know journals. Modern school lecturers are assessed on the usage of ICT because all things within academic institution revolve around ICT. Internet plays a major role in a research community. Academics broaden knowledge skill via the materials retrieved from the internet and many lecturers within academic institution hardly visit the library because the internet accommodates millions of library published articles [19]. In a work published by [20] said the convergence of computers and telecommunications technologies has made possible the activities which were considered impossible in the past. Internet facilities such as the e-mail, FTP, www, Talnet, mailing list etc can be used to enhance teaching and research. The facilities brings to academic staff up-to-date information in research community.

The increase in teaching and research output of academic staff is traceable to the services rendered by the internet. The internet enables academics download several material from different web sites [21,22,23]. There are impacts in the academic staff performance and this is based on the quality of papers in the 21st century [24,21]. In a comparative study between Babcock University and Covenant University showed that the increase in research output with internet services is more than the era before the internet [25]. In a study showed that the use of electronic literature by University of Finland improved their work in many ways. Because it provides access to literatures and has direct correlation to the content and quality of scholarly work.

[26] reported that the internet contributes positively to reference work of many library professionals and enhance effectiveness and efficiency. [27] showed that electronic journals are strongly accepted in Netherlands by scientist and social scientists and have serious impact on research work [21].

4 The Academic Institution and ICT

ICT in schools is a variable tool which enhanced educational content and learning techniques. It is a process that helps in the interactive instructive mechanism for teaching and bringing to the understanding of students. Applications and other add on devices provides attractive learning atmosphere for learners. Furthermore, the fundamental principle of ICT is on its access availability without necessary going through bureaucratic process of the traditional libraries. ICT provides easy to use mechanism without much burden on people and this flexibility has made many scholars embraced it positive impact so as to change the needed drawbacks in academics. Indeed, many homes in the developing countries like Nigeria are not privilege with the use of ICT. However, both secondary and higher institutions now provide the opportunity for people with the facilities and this create the opportunity for them to use and learn. Modern Schools have made it possible for people to know how ICT function and they do this through the acquisition of ICT facilities [28].

4.1 Teaching and ICT

Teaching via ICT can be interesting and this is because it offers a comparative and competitive advantage over the traditional method of teaching. However, this cannot be possible if both students, teachers, policy makers fails to negate the drawback associated. ICT can do better if the factors that influence the drawbacks are discontinued. Notwithstanding, factors such as attitude, competence, self development, experience, policy as well as others that could affect the deployment of ICT in teaching are controllable. In a survey conducted by [29,30] showed that the above factors could be classified into

(1) Teacher-level barriers
(2) School-level barriers and
(3) System-level barrier

These three levels are the basic of all barrier levels associated with none deployment of ICT in teaching or classrooms. The three must be able to harness for a smooth delivering or deployment of ICT in teaching.

4.2 Student performance and ICT correlation

Internet has brought a revolutionary change in today's world and has increase the scope and size of all academics. The idealistic nature of ICT in teaching is to boost student's performance and from the literature reviewed, it can be said that ICT has contributed immensely to the academic performance in both ways (directly and indirectly). Prior to the emergence of internet most of the traditional libraries were not habitable. In a school of over three million (3,000,000) students the library has a capacity of less than five hundred (500) students. So, the competition for space by students and lecturers was overwhelming. Availability of resource materials was another course for concern [31]. The internet via e-library has helped to mitigates if not eliminate these difficulties associated with the traditional method and has led to excellent performance on the part of the students. Lecturers can now download or get materials as at when needed and replicates the study on students [19, 21].

5 Research Approach

The investigation was hinged upon on survey method. The target population for the study comprised Postgraduate Students of the University of Benin (Uniben) who registered with the University Internet Facilities for the 2017/2018 academic session. The students figure stood at 3877 students. The random

sampling technique was used to select 300 students that formed the sample for the study. The instrument used for the collection of data was the questionnaire. A structured questionnaire was designed in line with the basic objectives of the study. The questionnaire for the research consists of both optional type and statements in a 4-point scale, a high percentage of about 268 about 89% were completely and correctly filled. They were received and found usable, the collected data was analyzed using the SPSS for statistical analysis and frequency and percentage was used to present result for the research questions raised while the t-test analysis was used to test hypothesis.

Table 1. Frequency of postgraduate use of Uniben Internet facilities

	Daily	**More than once a week**	**Occasionally**	**Total**
Used	107(39.1%)	76 (27.7%)	34(12.4%)	217 (79.2%)
Never used				57 (20.8%)
Total				268 (100%)

From the Table 1, it was observed that total of 217 (79.2) respondents make use of Uniben Internet facilities at different levels while 57 (20.8%) respondents never use the Uniben Internet facilities. One can therefore infer that the Uniben Internet facility enjoys very good patronage by the postgraduate students.

Table 2. Purpose of use of the Uniben internet facilities

Purpose of the use of Uniben internet facilities	Strongly agree	Agree	Disagree	Strongly disagree	Total
Assignment	138(50.4%)	102(37.2%)	24(8.8%)	10(3.6%)	268(100%)
Examination	114(41.6%)	95(34.7%)	45(16.4%)	20(7.3%)	268(100%)
Expansive reading	137(50%)	89(32.5%)	26(9.5%)	22(8%)	268(100%)
Social Media	28(10.2%)	31(11.3%)	191(69.7%)	24(8.8%)	268(100%)
Download for re-use	99(36.1%)	71(25.9%)	62(22.6%)	42(15.3%)	268(100%)

From Table 2, item 1 has 138 representing 50.4% of respondents who strongly agree that assignment is the reason for using internet, 102 which is 37.2% also agree to that notion, 24 representing 8.8% of the respondents disagree that assignment is the only reason for entering internet, while 10 representing 3.6% strongly disagree. It is equally observed that all the items above, with the exception of chat with friends on social media, received positive responses. It therefore shows that most students perceive that the purpose for using the Uniben Internet facilities is for academic work. This could be because those who had used the resources discovered that the managers of the Uniben Internet facilities programmed it in such a way that it grants the students access for academic purposes only.

Table 3. Perceived benefit of using the Uniben Internet facilities by students

Influence of uniben internet facilities	Strongly agree	Agree	Disagree strongly	Disagree	Total
Use of Uniben Internet facilities has aided my reading ability	96(35%)	108(39.4%)	46(16.8%)	24(8.8%)	268(100%)
Use of Uniben Internet facilities has influenced my research ability and therefore aid me in doing assignment	110(40.1%)	121(44.2%)	30(10.9%)	13(4.9%)	268(100%)
Use of Uniben Internet facilities has distracted me from my studies because of the Many social media available in it	28(10.2%)	26(9.5%)	136(49.6%)	84(30.7%)	268(100%)
Use of the Uniben Internet facilities aided my understanding of courses taught	124(45.3%)	89(32.5%)	48(17.5%)	13(4.7%)	268(100%)

From Table 3, it is observed that most respondents affirmed to the benefits of using the Uniben Internet facilities while lesser number 136 (49.6%) and 84 (30.7%) of the respondents consented to the Uniben Internet facilities being a distraction, in their perception. It is possible majority of this number are from those who had not used the Uniben Internet facilities before. It therefore shows that academic activities of many students have been positively impacted upon by the use of the Uniben Internet facilities.

Table 4. t-test analysis of variance difference in performance of postgraduates who use the University of Benin internet facilities and those who do not make use of it in their academic activities

Variables	N	Mean	SD	df	r-cal	p-value
Users	217	78.783	10.54			
				272	4.677	1.96
Non users	57	85.930	9.15			

P<0.05

Table 4 shows that the t-test was 1.96 at 0.05 level of significance while the t-value was 4.677. The Null hypothesis is therefore rejected. Hence, there is significant difference between the performance of users of the University of Benin internet facilities and those who do not use it, in their academic activities.

6 Findings Evaluation

The study examined the impact of ICT on the academic performance of postgraduate students in University of Benin. From the Findings, it can be said that most postgraduate students of the University of Benin make use of the Uniben ICT facilities. The study has also demonstrated the perceptions on the use of the ICT facilities but majority is of the view that is mainly for academic purposes as against social media use. Furthermore, the findings showed that most students agreed that the use of the facilities has impacted positively on student's academic performance. From the above analysis, there is corroboration of the findings to that of the views of [32] on the effects of ICT on students' academic achievement. ICT was found more effective on students' academic performance when in contrast with the traditional teaching facilities. The results of the findings are also consistent with [12] who found that ICT has positive impacted on student scores on secondary school level. Similarly, [33] in a published work showed that ICT integration into teaching and learning impact student performance positively in science subjects. In the same way, [34] said that ICT has positive effect on students' scores. Similarly, [35] explained that students performed better when taught through ICT as in contrast to those who were taught via the traditional approach. ICT has come to bridge the overwhelming drawback associated with the traditional approach of teaching thereby creating exciting atmosphere for students to do better in academics performance. The analysis from the Uniben Postgraduate students is an attestation to the positive revolution of ICT among students and this is not just for the postgraduate students only but across board.

7 Conclusion

Internet and other Information and Communication Technology facilities so far deployed to the teaching process of education by institutions have had both positive and negative impacts. Meanwhile, the negative influence is considered not to be an issue considering the scope of this paper. The premise to which this paper is on the impact of academic performance of the University of Benin Postgraduate students and to a setting degree, this paper has unveiled that there is a relationship between student performance and ICT. Though, many could argue that early education in developing country like Nigeria had well defined moral standard than the era of information and communication technology integration with education but this cannot rule out the fact of the positivism associated with ICT classroom integration because it bridged the divided world into a global village. Information remains a tool for national development and anything that can aid quick access to it should be considered on merit rather than the drawback. Conclusively, the findings by this work demonstrated that the postgraduate students of University of Benin (Uniben) have had better performance in academics with the integration of ICT in academic activities. Hence, its sustainability should be encouraged by all tertiary institutions and policy makers.

Competing Interests

Authors have declared that no competing interests exist.

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