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Full Length Research Paper

The impact of automated library services and usage on student's academic performance in Nigerian Universities

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This study examined the extent to which the use of automated electronic information services by students has influenced the academic performance of students in three tertiary institutions in Nigeria: University of Ibadan, Covenant University, Sango Ota and Ladoke Akintola University of Technology, Ogbomoso. One thousand and five hundred copies of questionnaire were administered to the users at the three universities. The results revealed that having pre university computer literacy did not account for better academic performance; and students who made use of automated library serves were better exposed to academic materials and performed academically better than those who did not make use of the services of tan automated library. The majority of the users agreed that there is a significant relationship between educational academic exposures with the use of the automated library services, and they were satisfied with these automated electronic library services. However, the major constraints identified by the respondents were slow internet speed, access and automated library facilities are not up and running at all times to meet the varied time students prefer to browse the internet. The research recommended institutions to enlarge their internet bandwidth and make it available anytime of the day or night when the students are free to make use of it.

Key words: Impact, automated, library services, academic performance.

INTRODUCTION

We use automated library to denote a library in which the collections of library materials are primarily on paper but in which the library procedures have been computerized. Libraries are very record-intensive: Not only is each title different but, for many purposes, the records needed for library operations must necessarily be concerned with individual copies of each title. A circulation system must know precisely which copy of which volume of which edition of which title was borrowed by precisely which borrower and when it is due back. Attributing the loan to some other borrower will not do; nor will substituting the return of some other document, even by the same borrower, be acceptable as a discharge of the loan. Acquisition records need to show precisely how many copies of a given work were ordered from which bookseller and which, if any, have so far been received. A library not knowing which titles it already has (and in how many copies) could not function efficiently. Serials records contain minute details of copies of issues, indexes, binding, and invoices in order to assure that each set is complete and properly acquired, bound, and paid for. Library records, then, must be specific to individual copies. In general it is desirable that library record-keeping be automated for three reasons:

1. Much of the work involves the accurate updating of records in files. The tasks involved are generally tedious, repetitive, mechanical in nature, and lend themselves to computerization, even though the records may be complex and arranged in complicated ways.
2. Automation is likely to improve cost-effective performance by increasing accuracy, by reducing the rate of increase in costs in labor-intensive activities, and by increasing effectiveness. It should become possible to do some tasks more thoroughly than levels of staffing usually permit with manual procedures, such as the regular claiming of unsupplied issues of periodicals, or by doing things that cannot in practice be done in paper files, notably searching for combinations of characteristics.

3. Automation permits decentralized access to records. A librarian in a branch library can verify the status of another without maintaining duplicate files, traveling to another department, or asking other staff to interrupt their work in order to find out. A user can check to see whether a book is out on loan without traveling to the library to see whether it is on the shelf. Considerations of service, of cost, and of the humane use of staff all argue for the use of computers to ease the burden and to increase the effectiveness of handling library records.

The internet is a global network of computers linked together over large distances (Brown, 1998). It was created by the American Military as a means of communication and has been in existence since the 1950s. Until mid to late eighties commercial organizations and educational institutions mainly used the internet. This was due to high costs. The rapid development of technology has seen improvement in communication links and a lowering of costs. The implication of this is that the internet is now more widely available to more people. Since the internet is now available to a wide sector of the population in the western world many educational establishments have seized on its educational potential. The internet is a valuable source of information for students looking for ideas for projects and assignments. With over 50 million web sites on the net the chances are that any information however obscure can be found. The only tools required to find this information would be some patience and a decent search engine (Ehrmann, 1995, 1998). It also serves as a useful tool for lecturers in helping to prepare lesson plans as there are a number of sites, especially in America, dedicated to providing educational material.

It also serves as a forum to promote group discussion, which is time and distance independent. There are many forms this group discussion can take. These include video conferencing, where by the use of a small video camera and microphone members of the group can actually see and hear each other. Also group discussion can take the form of chat rooms where everyone comes together in a host area and communicates with each other via the keyboard. Although there may be many advantages to be gained from using the internet as an educational tool, there are also many drawbacks. For first time users the internet can be a very unfriendly environment but with frequent use, they can get familiar with it pretty quickly.

The amount of information available on the net means that users tend to be side-tracked with a lot of unnecessary, useless information. As the internet is not owned by anyone there are no checks or censorship of information available. The upside to this is that information is freely available to everyone without restriction but the downside to this is that information can be placed into the wrong hands. Also as there are no checks on the information on the net this may lead to inaccuracies and misleading information being published (Massey, 1995).

The internet is heavily dependent on hardware which can be expensive especially as the internet is constantly evolving. This therefore means to take full advantage of this evolving technology, upgrades in hardware and software are required. With the advent of the internet, education has definitely benefited in more ways than can be mentioned; and although it will not take over the traditional methods of education, it will continue to play a major part (Abbey-Livingston and Abbey, 1982).

University of Ibadan started off as a College of the University Of London that is University College of Ibadan. It admitted its first set of students in 1948. The 32 year old Faculty of Technology is devoted to the advancement and application of knowledge through teaching/learning, research and scholarship in Agricultural Engineering, Civil Engineering, Electrical and Electronic Engineering, Food Technology, Industrial and Production Engineering, Mechanical Engineering, Petroleum Engineering and Wood Products Engineering. The Faculty of Science was one of the three foundation faculties at the inception of the University of Ibadan in 1948.

Ladoke Akintola University of Technology, Ogbomoso was established in the year 1990. The Faculty of Pure and Applied Sciences which is one of the four foundation faculties with which the University took off in 1990 comprises five Departments: Departments of Pure and Applied Biology, Pure and Applied Chemistry, Pure and Applied Mathematics, Pure and Applied Physics and General Studies.

The Covenant University, Sango Ota is the brain child of Reverend David Oyedepo of Living Faith Church, aka “Winners Chapel”. It is one of the first private universities to be established in Nigeria. It was founded in 2002 by the Winners Chapel in Ota, Ogun State. The chancellor is Dr. David Oyedepo. It is a competitive admission school where students are taught to fear God, become expert thinkers, and to develop Nigeria, Africa, and the world at large. The courses range from four to five years, and from the first year of each student's degree programme, they are taught 'Entrepreneurship' which is meant to build their ability to grow in their careers without dependence on the government. The university has three colleges, housing 20 departments. The colleges are the College of Business and Social Sciences, the College of Human Development and the College of Science and Technology.

The automated library is internet technology based. The internet has changed lives in many ways; it has changed the way we communicate, just like the automated library has changed the way we study and source for educational and learning materials. Through this process, it has given students a tremendous sense of educational empowerment. And it is the beauty of the automated library that every student user has now become a potential scholar.

Technology, in various forms, has always held forth the promise of improving education (Wenger, 1998;

Harrington, 1998). This is true whether one speaks of scholastic education or its cousins, corporate and commercial training programs. Computer-Assisted Instruction (CAI), instructional television (ITV), and programmed instruction (PI) can be counted as early examples of the application of information technology to education. The most recent and perhaps most visible cases are web-based training programs and degree-granting programs from fully accredited institutions offered via what is known as "distance learning." Technology succeeds, when it becomes commonplace. This is amply illustrated by such mundane and ubiquitous artifacts as chalkboards, training films and videos, over-head projectors and transparencies, software such as Microsoft, PowerPoint, and perhaps the most common of all, the textbook.

Teaching and learning can both be defined as processes, that is, as bounded portions of larger streams of activity. The teacher does one and the learner does the other. Teaching might or might not lead to learning (Baer, 1999). The relationship between the two processes is neither fixed nor guaranteed. However, Wenger (1998) has observed that teaching and learning are not inherently linked. More importantly, teaching and instructional materials are resources for learning in ways that often differ from those embedded in pedagogical intentions. For example, reading assignments in a course on literature can result in learning on the part of students that has nothing whatsoever to do with the teacher's instructional objectives. In other words, what is taught and what is learned may differ.

USE OF AUTOMATED LIBRARY SERVICES IN TERTIARY INSTITUTIONS

Two distinct models guide current efforts to make use of the internet in higher education. The first approach seeks to improve existing forms and structures of post-secondary instructions to create "better, faster, cheaper" versions of today's courses and curricula by means of the internet as it is done through an automated library service. This model emphasizes building an on-campus information infrastructure that provides (or will provide) high-speed internet connectivity to all students, faculty, administrators, and staff. Faculty then can use this infrastructure to improve and supplement traditional courses and degree programs. Library holdings can be digitized and made available both on-and off-campus. Administrative processes can be speeded up and simplified. And although the focus remains on on-campus instruction, this new information infrastructure can facilitate distance learning for many categories of nontraditional, off-campus students. While this model of internet use in higher education requires many changes among faculty, students, and administrative roles and functions, it keeps most existing institutional structures and faculty roles intact (Baer, 1999).

The second approach is a more radical model which envisions the internet as instrumental to a fundamental change in the processes and organizational structure of post-secondary teaching and learning. According to this approach, the internet can transform higher education into student-centered learning rather than institution- and faculty-centered instruction. It can allow agile institutions-old and new- to leapfrog existing academic structures and establish direct links to post-secondary students. It can encourage new collaborative arrangements between academic institutions and for-profit entrepreneurs and permit these partnerships will in turn extend their reach nationally and internationally.

However, it has been observed that this approach can engender students' demand for postsecondary education in new ways that are basically campus-independent. It may threaten existing institutions of higher education rather than support them (Baer, 1999; Harvey, 1998). Drucker (cited by (Brown and Duguid, 1996) remarked: "Thirty years from now the big university campuses will be relics. . . The college will not survive as a residential institution." This opinion however did not evaluate the impact of the teacher and the campus environment on learning before arriving at this conclusion. Students are likely to prefer the internet as a supplement to its use as the main method of instruction.

COST AND OTHER OBSTACLES TO ON-CAMPUS INTERNET INSTRUCTION

The impact of internet access on on-campus instruction is still very low for various reasons. The technology is new, very costly, and perhaps too threatening to existing academic structures and traditions (Brown and Duguid, 1996). Ignoring the potentials of this new technology for learning will lead to institutions being less competitive and attractive to prospective students. The rapid development in the telecommunications industry holds greater promise for education. Concerns about technology's impact on teaching are not confined to the internet. Of course, the same possibilities and problems were raised fifty years ago with instructional television, and more recently with personal computers and multimedia CD-ROMs. With a few exceptions such as the Rensselaer Polytechnic Institute "studio courses," television and instruction and have not led to improvements in users performance. Like these technologies, the internet must overcome the innate conservatism of academia and a host of institutional obstacles if it is to become more than a supplementary, cost-additive element of on-campus instruction (MacArthur and Lewis, 1996).

With the adoption of the internet by most foreign institutions and the resultant drop in costs Nigerian institutions are considering investing in internet facilities.

STATEMENT OF THE PROBLEM

The automated library perpetuates some of the problems of the paper library noted previously. Because the collections of documents are still on paper, a localized medium, the need for local collections, the space needed for paper documents, the inflexibility of paper documents, the separation of documents from the users, opening hours for the collections (though no longer for the catalog), and competition for use of copies of documents all remain as much a problem in both libraries: the automated library and the paper library. The catalog may be used in a number of places. In particular, with remote access to the on-line catalog, the user is no longer separated from the catalog and the separation of catalog and documents is somewhat diminished since, online, a catalog can at long last be used in the book-stacks. The automated library represents a significant improvement but for only some of the problems and, aside for the online catalog, benefits directly those who are providing the service rather than those who are using the service.

Currently the internet offers a range of services to users, such as e-mail, the World Wide Web, Usenet news, telnet, and others. Information research is a dedication to learning. This needs specific research skills, an awareness of research tools and gifted mind. Without knowledge of and access to relevant research worthy resources, your search will be severely limited and doubtful. Internet is the only vast field of exploring what provides us the source of research tools. If we give the name 'explorer' to the internet that would not be wrong, in a sense that explorer itself means to inquire something or to examine something. Internet is widely used in the field where there is a work of research. Internet is not minimized to this field only, it also provides us with the best source of entertainment.

The purpose of this study is to access the impact of automated library services and usage on students' academic performance in three selected tertiary institutions in Nigeria. The specific tasks were to:

(a) Examine the extent to which students with pre-university computer literacy perform better than student's without pre- university computer literacy in the use of the services of an automated library and
(b) Evaluate the relationship between high academic performance of students with automated library access and those without automated library access,

RESEARCH HYPOTHESES

The investigation into the issues mentioned in the preceding section will be guided by the following null hypothesis:

1. There is significant relationship between the high academic performance of students with automated library access and those without automated library access,
2. There is significant relationship between the educational exposures of students with automated library access and those without automated library access,
3. There is no significant relationship between academic performance of male students and female students, who use automated library services,
4. There is no significant relationship between students who have pre-university computer literacy and students who have not been in the use of the services of an automated library.

PURPOSE OF THE STUDY

The recent commercialization of the internet in Nigeria has revolutionalised our information flows and educational systems. The internet is now being used in a variety of ways to promote productivity, education, research and learning in Nigeria. Internet usage for education is now manifest in automated library service and its usage is just receiving recognition because of the need by most institutions to operate distance-learning programs and the need to connect students and academic staff to global resources for improved learning and research.

A number of Nigerian universities such as University of Ibadan, Covenant University, Ota and Ladoke Akintola University of Technology, Ogbomoso have internet facilities while other universities are at various stages of implementation. These institutions provided automated library access for students. This is because the internet is seen as an educational tool and of great relevance to the academic development of the student.

Students form the major population in higher institutions and the introduction and success of any new technology within the educational framework should consider them. Provision of internet access to students through automated library service creates a large research pool for maintenance and sustenance of the academic culture of excellence. Thus, this study seeks to provide information on the impact of automated library services and usage on students' academic performance in Nigerian universities. This impact of automated library service as an internet based knowledge acquisition tool for students affects students' academic performance. If the internet is seen to impact academic performance in students most universities would be encouraged to invest in the technology (Ossai, 2009).

RESEARCH DESIGN

This study is purely a survey. Thus, it is determined towards achieving the current result in this sector of study. To that end, this study attempts to examine the impact of automated library services and usage on students' academic performance in Nigerian universities.

Table 1. The summary table of chi-square (X^2) analyses showing the relationship between the high academic performance of students with automated library access and those without automated library access.

Student's academic performance	Automated library standard			
	High	Moderate	Low	Total
Above average	164	150	156	470
Average	160	180	170	510
Below average	206	140	174	520
Total	530	470	500	1500

X^2 calculated = 10.82.X^2 Critical = 9.49.Df = 4. Level of significance = 0.05. Decision = Null hypothesis rejected. Remark = significant.

Population and sample

The population targeted for use in this study consists of students of Nigerian universities. From this population a sample size of one thousand five hundred (1500) students from three universities: University of Ibadan, (a Federal University, 500); Ladoke Akintola University of Technology, Ogbomoso (a State University, 500) and Covenant University, Sango Ota, (Private University, 500) were chosen randomly.

Research instrument

The main instrument of study is questionnaire, designed to draw out differing responses from the students ranging from sex, age, course of study, and level of study, on their use of the services of an automated library. On each item presented in the questionnaire, the respondents are required to tick (√) in the appropriate column.
The research instrument is designed to investigate the impact of automated library services and usage on students' academic performance in Nigerian universities.
The major issues are:

1. Automated library access.
2. Educational exposures of students.
3. Academic performance of male students and female students who use automated library services.
4. Pre-university computer literacy.

Validity of the instrument

The study made use of questionnaire for obtaining responses from the respondents. The questionnaire was designed to obtain personal information from the students and their use of the automated library services in their various institutions and its impact on their academic performance.

Data analysis

The data generated from the 1,500 respondents were collated, organized and analyzed around the four null hypothesis formulated in the study.

Testing the hypotheses

H_1

This hypothesis states that: there is significant relationship between the high academic performance of students with automated library access and those without automated library access. In testing the above hypothesis, the chi- square (X^2) test for significant was employed. The test was performed at 0.05 level of significance. The result is presented in Table 1 below.
From Table 1 the null hypothesis of significant relationship is rejected. This is because the chi-square (X^2) calculated (10.82) is greater than chi-square (X^2) critical (9.49). This implies that the null hypothesis of significant relationship between the high academic performance of students with automated library access and those without automated library access is significant.

H_2

It was hypothesized that there is significant relationship between the educational exposures of students with automated library access and those without automated library access. To test this hypothesis, the relationship between educational exposures and students' academic achievement, chi-square (X^2) test of significance was employed. The test was performed at 0.05 level of significance. The result is presented in Table 2.

From Table 1, the null hypothesis of significant relationship is rejected. This is because the chi-square (X^2) calculated (33.79) is greater than chi-square (X^2) critical (9.49). This implies that there is significant relationship between the educational exposures of students with automated library access and those without automated library access.

H_3

This hypothesis states that there is no significant relationship between academic performance of male students and female students that use automated library services. In testing the above hypothesis, the chi- square(X^2) test of significant was employed. The test was performed at 0.05 level of significance. The result is presented in Table 3.

From the result presented in Table 1, the null hypothesis of no significant relationship tested is accepted. This is because the chi-square (X^2) calculated (8.85) is less than chi-square (X^2) critical (9.49). This implies that there is no significant relationship between academic performance of male students and female students who use automated library services.

H_4

Hypothesis four states that there is no significant relationship between students who have pre-university computer literacy and students who have not, in the usage of the services of an automated library. A chi-square (X^2) test of significance was used to test this hypothesis. The test was performed at 0.05 level of

Table 2. Chi-square (X^2) analysis of the relationship between the educational exposures of students with automated library access and those without automated library access.

Student's academic performance	Automated library standard			
	High	Moderate	Low	Total
Above average	160	175	190	525
Average	150	134	171	455
Below average	130	241	149	520
Total	440	550	510	1500

X^2 calculated = 33.79. X^2 Critical = 9.49.Df = 4. Level of significance = 0.05. Decision = Reject null hypothesis. Remark = significant.

Table 3. Chi-square (X^2) analysis of the relationship between academic performance of male students and female students who use automated library services.

Student's academic performance	Automated library standard			
	High	Moderate	Low	Total
Above average	160	195	170	525
Average	124	150	181	455
Below average	156	200	164	520
Total	440	545	515	1500

X^2 calculated = 8.85, X^2 Critical = 9.49, Df = 4, Level of significance = 0.05, Decision = Accepted, Remark = Not significant.

Table 4 .Summary table of Chi-square (X^2) analysis showing the relationship between students who have pre-university computer literacy and students who have not in the usage of the services of an automated library.

Student's academic performance	Automated Library standard			
	High	Moderate	Low	Total
Above average	165	180	175	520
Average	180	180	170	530
Below average	155	150	145	450
Total	500	510	490	1500

X^2 calculated = 1.49.X^2 Critical = 9.49. Df = 4.Level of significance = 0.05. Decision = Accepted. Remark = Not significant.

significance. The result is presented in Table 4.

From the result presented in Table 4, the null hypothesis of significant relationship tested is accepted. This is because the chi-square (X^2) calculated (1.94) is less than chi-square (X^2) critical (9.49). This implies that there is no significant relationship between students who have pre-university computer literacy and students who have not, in the usage of the services of an automated library.

RESEARCH FINDINGS AND DISCUSSION

A review of the study under consideration based on the afore-stated tables shows certain major findings in this research. These findings are:

1. There is significant relationship between the high academic performance of students with automated library access and those without automated library access,
2. There is significant relationship between the educational exposures of students with automated library access and those without automated library access,
3. There is no significant relationship between academic performance of male students and female students, who use automated library services and those without automated library services,
4. There is no significant relationship between students who have pre-university computer literacy and students who have not in the use of the services of an automated library.

The thesis of this work asserts that students who make use of automated library service perform better than students who do not. This study made a preliminary quantitative attempt to test the thesis that students who use the automated library service tend to have higher levels of university academic performance because they use and access the facilities provided through automated library service. A convenient sample of some students in three Nigerian universities from different faculties of study

might point to this thesis. An analysis of the survey data found that after controlling for relevant variables, students' academic performance in Nigerian universities can be traced to their use of automated library service.

This study has particularly examined that indeed the adoption of ICT in the Nigerian educational system is beneficial, going by what the analyzed data collected on the students' usage of automated library service. It has been shown that adoption level of ICT in 1997 of which automated library service is a part of, in terms of availability and utilization, is presently at an average. The frequency of use is also at an average level. According to sources close to the Computer Association of Nigeria (CAN), there were between 500,000 and 650,000 computer systems in Nigeria as at 1997 (Vanguard, 26 August, 1998). This will translate into a rate of 6.5 computers per 1000 population. This low computer availability rate understandably accounts in part for the low per capita level adoption (Busari, 2001).

The adoption of automated library service an ICT innovation in the service sector of the educational system has positively impacted students. Analyses have revealed that the operating efficiency has improved greatly since the adoption of ICT. Information processing has become faster, more accurate and reliable. In the research sector on the other hand, adoption of automated library service has had an appreciable positive impact. Analysis revealed that access rate is very high in the areas of automated library usage and services. Other areas of application include information processing, data analysis and record keeping, especially for inventory control and accounting by staff.

The impact of automated library service adoption was noticeable in the areas of accessibility to educational materials in the public domain which as revealed by the analysis went up to an average level by those who readily access the materials. Other areas where the impact was significant were improvement in the research capability, efficiency; and opportunities for educational prospect and a friendlier learning environment.

Conclusion

The results from this experimental study show that there is a significant relationship in the academic performance of students with automated library access and those without. This thus proves the null hypothesis significant. The questionnaire results for the various respondents who use automated library service were significantly better than those who do not. Academic performance still ranks first on students' use of the automated library as an information source for retrieval of academic and professional issues.

Automated library service being internet based can be used to advantage for knowledge acquisition purposes by serving as an alternative to scarce and outdated books. Instructors or Lecturers can refer students to educational websites for more information (Thorin and Sorkin, 1997). Automated library service access should be made available at all hours because of the varied time students prefer to browse. This will ensure that students do not miss lectures due to the need to browse the internet.

An essential element of development in any nation is its level of literacy and the training opportunities made available to its citizenry. There is no doubt that a well-educated society will be a direct beneficiary of technology development. Empirical evidence had shown that the more educated societies have higher rates of technology adoption and diffusion than the less educated ones. The patterns of investment in education in such countries have also been noticed to be long term in nature and consistently at a reasonable level of GDP. The point must be made again that qualitative education is very expensive and a long term investment requires the active involvement of the state. The state must lead the way by initiating policies that will encourage other operators in the economy to invest in both formal and informal education. Empirical evidence has also shown that there is presently a dearth of engineers and technicians relevant to the development of ICT components in Nigeria.

In other words, there is need for concerted efforts to initiate a programme that will build to a comfortable level, the base of human resources in Nigeria. It follows again that development of education is a critical success factor in the adoption and diffusion of automated library services in Nigeria. The shortage of trained and experienced managers to lead the introduction of complex and rapidly evolving technology will have limited effect on the progress in the sector.

RECOMMENDATIONS

The automated library facilities should be up and running at all times to meet the varied time students prefer to browse the Internet. This will reduce traffic congestion, monopoly of computer systems connected to the internet and students jostling for access.

A central access point to or from the automated library should be dedicated for student use. This point should be well equipped to meet the student population. The management of the access point can be contracted out to a private entrepreneur or managed by a competent committee. Appropriate billing systems should be put in place if necessary to fund the management of the service.

Lecturers should refer students to websites for additional information. The additional information will compliment the classroom teaching and widen the student's concept of the topic under discussion. Students may use the internet facility mainly for communication purposes if lecturers do not refer them to search for information on subject topics and present a written report.

To provide access to the automated library services or

facilities, students' matriculation numbers should be used. The matriculation numbers will serve as usernames and students can supply their own password. The usernames will allow access to the network from where they are connected to the internet.

Higher institutions should ensure that the speed of the connection (bandwidth) is sufficient to cater for all users' (staff and students) needs. Good response time when users request for information on the internet will make them constant users of the internet facilities.

Finally, the government should endeavour to increase the subvention to schools since education is capital intensive. Automated library service is quite expensive and expansive and needs a lot of funds which universities alone cannot bear.

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