



**AN EVALUATION OF THE IMPACT OF INTERNET  
BROWSING ON STUDENTS' ACADEMIC PERFORMANCE  
AT THE TERTIARY LEVEL OF EDUCATION IN NIGERIA**

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## **Summary (max 3 pages)**

The research work evaluated the Internet as a knowledge acquisition tool and its impact on academic performance of students selected from five science-based courses (Mathematics, Physics, Computer Science, Civil and Mechanical Engineering). The study used two tertiary institutions in Oyo State, Nigeria.

The summary of the results obtained are:

1. There is a significant difference in the results of students with Internet access and those without Internet access.
2. There was a significant improvement in the posttest scores of the test group.
3. There were more male participants than female participants.
4. Students use the Internet an average of two / three days per week.
5. The male participants prefer night browsing, while the female participants prefer the daytime.
6. Most of the participants started using the Internet in year 2001.
7. The male participants were generally older than the female.
8. Electronic mail (email) is the most popular use of the Internet among students.
9. Almost all students have used the Internet before.
10. About 60% of students are in the 21-25 age bracket.

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## **Introduction**

The Internet is a global network of computers linked together over large distances. It was created by the American Military as a means of communication and has been in existence since the 1950's. Up until the 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 any information however obscure can be found. The only tools required to find this information would be some patience and a decent search engine. 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 users can get familiar with pretty quickly.

The amount of information available on the net means that user tend to be side-tracked with a lot of unnecessary useless information. As the Internet is not owned by any one there are no checks or censorship of information available. The upside to this is that information is freely available to everyone with out 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.

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.

University of Ibadan started off as a college of the University of London 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. The Faculty expanded steadily from its initial six departments

of Botany, Chemistry, Geography, Mathematics, Physics and Zoology. The Faculty now consists of ten departments of Archeology and Anthropology, Botany and Microbiology, Chemistry, Computer Science, Geography, Geology, Mathematics, Physics, Statistics and Zoology.

Ladoke Akintola University of Technology, Ogbomosho 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 of five Departments: Departments of Pure and Applied Biology, Pure and Applied Chemistry, Pure and Applied Mathematics, Pure and Applied Physics and General Studies. The Faculty of Engineering and Technology is also a foundation faculty and comprises of departments like Computer Science and Engineering, Civil Engineering, Mechanical Engineering, Food Technology and Engineering, and Electrical and Electronics Engineering.

## **Literature Review**

Technology, in various forms, has always held forth the promise of improving education (Wenger, 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, overhead projectors and transparencies, software such as Microsoft's 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 Internet 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 instruction-to create "better, faster, cheaper" versions of today's courses and curricula by means of the Internet. 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, student, 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 post-secondary 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).

Accepting this view, a celebrated management consultant and social commentator Peter Drucker, recently remarked: "Thirty years from now the big university campuses will be relics. . . . The college won't 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 & 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 computers have had only marginal effects on 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 & 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.

### Evaluating the Use of Technology in Education

The use of technology in the learning process can be evaluated using the FlashLight Toolkit method.

To apply this method three elements are required:

- ?? a technology (e.g. Internet)
- ?? an activity for which it is used (e.g. information search), and
- ?? the educational outcome of the activity (e.g. increased knowledge about topic)

The Flashlight approach to studying, teaching and learning with technology relies on this simple construct. It is called a "triad" because it has only three elements.

The triad's structure suggests five sets of related questions:

- I. **Questions about the technology *per se*** (e-mail, for example). For example, questions about its availability and reliability; if the technology can't be used, this triad can't work.
- II. **Questions about the use of the technology** . For example, is the technology an effective tool for *this* activity, or is it problematic and limiting? . It is futile to study

technology and learning outcomes without also studying how the technology has actually been used. (Ehrmann, 1998).

- III. **Questions about the activity *per se*.** For example, how much do teachers value teaching in this way; if they don't believe this activity is valuable, they are not likely to use technology to carry out the activity for the first time, or to do the activity better than before? Questions about the activity are also useful in comparing courses that use different (old and new) technologies for the same activity.
- IV. **Questions about whether and how the activity is contributing to the outcome (in this study, improved retention).** For example, do people who achieve the outcome report that they actually participated in the activity? Do they claim that the activity was valuable in achieving the outcome?
- V. **Questions about the outcome *per se*** (retention, in this study). For example is the retention looking good? Is there evidence that the retention is valuable when attained?

If the answers from these five questions are affirmative, then the result can sometimes be a reasonably continuous chain of evidence that links technology to activity, and activity to outcome. The study may not be absolutely convincing, but it can be done with a reasonable effort and the findings can support some practical reasoning about the value of the technology and how to use it better in this context. This kind of evidence has already proven valuable for making choices in educational institutions. (e.g., Brown, 1998; Harrington, 1998; Harvey, 1998).

## **Statement of the Problem**

The purpose of this study is to evaluate the effect of Internet access on students' academic performance in two selected tertiary institutions in Nigeria.

The specific tasks were to:

- (a) **examine 'Internet Browsing' as a knowledge acquisition tool, and**
- (b) **evaluate the effect of the 'Internet Browsing' on students' academic performance**

## **Significance of the Study**

The recent commercialization of the Internet in Nigeria has revolutionised our information flows and systems. The Internet is now being used in a variety of ways to promote productivity, communication, business, advertisement, and marketing in Nigeria. Internet usage for Education is just receiving recognition because of the need by most institutions to operate distance-learning programs and the need to connect academic staff to global resources for improved teaching and research.

A number of Nigerian Universities such as University of Ibadan, Obafemi Awolowo University, Ile-Ife and University of Jos, have Internet facilities while other Universities are at various stages of implementation. These institutions provided Internet access for staff (academic and administrative) only, leaving students to fend for themselves. This is because the Internet is seen as a communication tool and of little 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 will create a large revenue base for the maintenance and sustenance of the Internet facilities.

Thus, this experimental study seeks to provide information on the impact of the Internet as a knowledge acquisition tool for students and its effect on student's academic performance. If the Internet is seen to impact academic performance in students most Universities would be encouraged to investment in the technology.

## **Hypotheses**

Ho 1: "There is no significant difference in the academic performance of students [in Physics, Mathematics, Computer Science, Civil and Mechanical Engineering] with Internet access and those without Internet access."

## **Methodology**

### **Research Design**

This research work was Experimental in nature. The study made use of two groups of students. One group(test group) was exposed to Internet access, while the other group (control group) was not. UI students will form the test group, while LAUTECH students will be the control group without access to the Internet. LAUTECH and Ogbomoso town as at the time of the study did not have any Internet facility hence this grouping method.

### **Sample and Sampling Technique**

The purposive sampling technique was used. The study focused on 300, 400 and 500 level students selected from five (5) science and applied science-based departments in the University of Ibadan (UI), Ibadan and Ladoke Akintola University of Technology (LAUTECH), Ogbomoso.

Forty participants were used from each of the Departments selected in LAUTECH because the 400 Level students were on 6 months Industrial Attachment outside the campus. The prevailing Academic Staff Union of Nigerian Universities (ASUU) strike action led to a reduction in the number of participants from UI. Only 160 out of the expected 200 students could participate. Five of the participants in the test group were not from the Departments selected for the study but were enrolled in science-based courses.

### **Research Instruments and Validity Indices**

The study made use of a registration form, aptitude tests (pre and post) and Internet training manual as instruments for obtaining responses from the participants.

The registration form was designed to obtain personal information from the student and their use of the Internet.

The aptitude tests were used to determine the student's academic performance and intellectual capability so as to eliminate the influence of other factors in the test. The test contained questions on mathematics, physics, English language, general computing, and Internet. The test was slightly modified for the post-test to reflect the sites visited on the Internet.

The Internet training manual was designed to train the students on the use of the Internet, however it was discovered that all the participants knew how to use the Internet.

### **Data Collection**

The study used data from the registration form and the aptitude tests in the evaluation of the effect of Internet browsing on student's academic performance. The researchers planned on using the University conducted examinations as a performance evaluation tool between the two groups. This was not possible due to the prevailing Academic Staff Union of Nigerian Universities (ASUU) strike at the time.

The data was collected in stages. The first stage involved students filling the registration form and taking the pretest. The test group was then provided with Internet

access for two weeks at four (4) hours per week. After two weeks, both groups were then given a posttest.

### *Collation and Treatment of Data*

The data supplied on the registration form and marks obtained in the aptitude tests were coded and stored in the Statistical Package for Social Scientists (SPSS) software version 7.5.

A number of statistical techniques such as frequencies, cross tabulations, chi-square and so on were applied to the data collected. The statistical results and subsequent interpretations follow below.

## Analysis of Data

### Frequency Tables

Table 1

**Age**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 16-20	12	3.3	3.3	3.3
21-25	207	57.5	57.5	60.8
26-30	128	35.6	35.6	96.4
Above 30	13	3.6	3.6	100.0
Total	360	100.0	100.0	
Total	360	100.0		

Table 1 shows that 3.3% of the study population is below 20 years old, 57.5% are in the 21-25 age bracket, 35.6% in the 26-30 age bracket and only 3.6% above 30. The age distribution among the brackets show that about 87% of the population are adults.

Table 2

**level**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 300	169	46.9	46.9	46.9
400	67	18.6	18.6	65.6
500	124	34.4	34.4	100.0
Total	360	100.0	100.0	
Total	360	100.0		

The study population is composed of 169 at 300level, 67 at400level and 124 at 500 level students. There are more students at the 300level because that is the level common to both groups. The 400level students for the control group were not available for the study, as they had gone for the mandatory 6 months Industrial training outside the campus.

Table 3

**sex**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid male	304	84.4	84.4	84.4
female	56	15.6	15.6	100.0
Total	360	100.0	100.0	
Total	360	100.0		

From Table 3, 84.4% of the participants are male and 15.6% are female. This indicates that there are more male students in science-based courses.

Table 4

**do you use Internet**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid no	4	1.1	1.1	1.1
yes	356	98.9	98.9	100.0
Total	360	100.0	100.0	
Total	360	100.0		

With just 1.1% stating that they have not used the Internet before, Table 4 shows that students are not new to the Internet. Therefore the University authorities should be rest assured that investing in Internet access for students will not be a failure since they already use the technology.

Table 5

**when first use Internet**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 1999	7	1.9	1.9	2.8
2000	114	31.7	31.7	34.4
2001	192	53.3	53.3	87.8
2002	44	12.2	12.2	100.0
0	3	.8	.8	.8
Total	360	100.0	100.0	
Total	360	100.0		

From Table 5 above, only 1.9% used the Internet in 1999, 31.7% in 2000, 53.3% in 2001 and 12.2% in 2002. It was in year 2001 that most participants started using the Internet. The table shows an increase from year 1999 to 2001 and a decrease in year 2002, indicating that it was there was a rush for Internet access and literacy in the years 2000 and 2001 by students. The relatively large number of Internet users in year 2001 might be due to the availability of Internet access in more towns, reduced cost of use and a need to use the email service of the Internet.

Table 6

**use I to email**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid first	311	86.4	86.4	87.2
second	46	12.8	12.8	100.0
	2	.6	.6	.6
0	1	.3	.3	.8
Total	360	100.0	100.0	
Total	360	100.0		

The results of the ranking of Internet (I) use shows that 86.4% of the participants ranked email first and 12.8% second. The results from Table 6 infer that email is widely used by students when they have Internet access. In providing Internet access, consideration should be given to whether students will be allowed to use web-based email hosts or the local email host.

Table 7

**use I to do school work**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid first	4	1.1	1.1	36.9
second	74	20.6	20.6	57.5
third	153	42.5	42.5	100.0
	129	35.8	35.8	35.8
Total	360	100.0	100.0	
Total	360	100.0		

The results shown in Table 7 state that 1.1% of the study population ranked the use of Internet for schoolwork first, 20.6% ranked it second, and 42.5 ranked it third. 35.8% of the participants did not rank it. As at now students are not utilizing the Internet for academic purposes. Those who ranked it first may be final year students who used the Internet to obtain information on subject topics that were not well documented in books or available in the library.

Table 8

**use I to obtain info**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid first	45	12.5	12.5	28.6
second	221	61.4	61.4	90.0
third	36	10.0	10.0	100.0
	56	15.6	15.6	15.6
0	2	.6	.6	16.1
Total	360	100.0	100.0	
Total	360	100.0		

Table 8 shows that 12.5% of the participants ranked the Internet first for information purposes. 61.4 % ranked it second and 10% ranked it third. The content of the information is not academic because the respondents would have ranked this option low and the Internet use for schoolwork would have been ranked high. With 90% of the study population engaged in using the Internet to obtain information, it is simply a matter of focusing this information to academic information.

Table 9

**how do you fund ur browsing**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid I browse free	1	.3	.3	1.1
My friends pay	12	3.3	3.3	4.4
I pay	344	95.6	95.6	100.0
0	3	.8	.8	.8
Total	360	100.0	100.0	
Total	360	100.0		

Internet access is not free someone has to pay. In Table 9, a very high percentage (95.6%) of the participants pay for their own Internet access. This shows that students will pay for Internet access if provided by the University. There are various pricing techniques available now that make it affordable for all to pay for their Internet browsing charges.

Table 10

**email address**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid no	4	1.1	1.1	1.1
yes	356	98.9	98.9	100.0
Total	360	100.0	100.0	
Total	360	100.0		

Table 10 shows that 98.9% of the study population have email addresses. These email addresses are all on free web-based email hosts such as yahoo, hotmail and 37.com. The results support the conclusion from Table 6 that most students use the Internet mainly for communication purposes.

Table 11

**time prefer to browse**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid morning	76	21.1	21.1	21.9
afternoon	136	37.8	37.8	59.7
night	145	40.3	40.3	100.0
0	3	.8	.8	.8
Total	360	100.0	100.0	
Total	360	100.0		

The time respondents prefer to browse the Internet was divided into three parts of the day, morning, afternoon and night. From the table above, about 21% prefer morning time, 37.8%

chose afternoon as being appropriate and about 40% prefer the night. The charges are different between the day and night periods. Also the time available for browsing at night is longer and cheaper.

Table 12

**days per week on Internet**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 0	4	1.1	1.1	1.1
1	13	3.6	3.6	4.7
2	138	38.3	38.3	43.1
3	128	35.6	35.6	78.6
4	36	10.0	10.0	88.6
5	34	9.4	9.4	98.1
6	7	1.9	1.9	100.0
Total	360	100.0	100.0	
Total	360	100.0		

The participants were asked how many days, hours and minutes they spent on the Internet per week. The responses given indicate that about 74% of the study population spends two to three days per week on the Internet browsing. This shows that students require Internet access for at least two days per week to enable them communicate and obtain information.

Table 13

**Age \* sex Crosstabulation**

		sex		Total	
		male	female		
Age	16-20	Count	11	1	12
		% of Total	3.1%	.3%	3.3%
	21-25	Count	170	37	207
		% of Total	47.2%	10.3%	57.5%
	26-30	Count	111	17	128
		% of Total	30.8%	4.7%	35.6%
	Above 30	Count	12	1	13
		% of Total	3.3%	.3%	3.6%
Total		Count	304	56	360
		% of Total	84.4%	15.6%	100.0%

Male participants form 84.4% of the total study population. The 21-25 age bracket has the highest percentage of male (47.2%) and female (10.3%) participants. Only one female participant is above 30, while twelve male participants are above 30. From the table above, it can be deduced that female students are generally younger with most of them in the 21-25 age bracket.

Table 14

**relevant info on Internet \* how often get relevant info Crosstabulation**

			how often get relevant info				Total
			not at all	sometimes	often	0	
relevant info on Internet	no	Count	107			3	110
		% of Total	29.7%			.8%	30.6%
	yes	Count	2	163	85		250
		% of Total	.6%	45.3%	23.6%		69.4%
Total		Count	109	163	85	3	360
		% of Total	30.3%	45.3%	23.6%	.8%	100.0%

There is a significant relationship between those who stated they get relevant information on the Internet and the frequency of obtaining such information. Of the 250 participants who stated they obtain relevant information on the Internet, only 85 obtain the information regularly, while 45.3% sometimes get relevant information on the Internet.

Table 15

**Age \* when first use Internet Crosstabulation**

			when first use Internet					Total
			1999	2000	2001	2002	0	
Age 16-20	Count			3	5	4		12
	% of Total			.8%	1.4%	1.1%		3.3%
21-25	Count	4	57	120	24		2	207
	% of Total	1.1%	15.8%	33.3%	6.7%		.6%	57.5%
26-30	Count	3	44	64	16		1	128
	% of Total	.8%	12.2%	17.8%	4.4%		.3%	35.6%
Above 30	Count		10	3				13
	% of Total		2.8%	.8%				3.6%
Total	Count	7	114	192	44		3	360
	% of Total	1.9%	31.7%	53.3%	12.2%		.8%	100.0%

Participants in all age groups (except the above 30 group) had a higher number of them using the Internet first in year 2001.

Table 16

**level \* Age Crosstabulation**

			Age				Total
			16-20	21-25	26-30	Above 30	
level 300	Count		12	109	46	2	169
	% of Total		3.3%	30.3%	12.8%	.6%	46.9%
400	Count			40	24	3	67
	% of Total			11.1%	6.7%	.8%	18.6%
500	Count			58	58	8	124
	% of Total			16.1%	16.1%	2.2%	34.4%
Total	Count		12	207	128	13	360
	% of Total		3.3%	57.5%	35.6%	3.6%	100.0%

The 300 level participants in the Departments had most participants and a high number in the 21-25 age bracket.

Table 17

**level \* sex Crosstabulation**

			sex		Total
			male	female	
level 300	Count		146	23	169
	% of Total		40.6%	6.4%	46.9%
400	Count		51	16	67
	% of Total		14.2%	4.4%	18.6%
500	Count		107	17	124
	% of Total		29.7%	4.7%	34.4%
Total	Count		304	56	360
	% of Total		84.4%	15.6%	100.0%

Table 18

**level \* when first use Internet Crosstabulation**

			when first use Internet					Total
			1999	2000	2001	2002	0	
level 300	Count		2	33	91	41	2	169
	% of Total		.6%	9.2%	25.3%	11.4%	.6%	46.9%
400	Count		2	26	39			67
	% of Total		.6%	7.2%	10.8%			18.6%
500	Count		3	55	62	3	1	124
	% of Total		.8%	15.3%	17.2%	.8%	.3%	34.4%
Total	Count		7	114	192	44	3	360
	% of Total		1.9%	31.7%	53.3%	12.2%	.8%	100.0%

The statistical analysis shows that a significant relationship exists between student level in the University and when they first used the Internet. The results shows that all levels had the highest contact with the Internet in year 2001.

Table 19

**sex \* university group Crosstabulation**

			university group		Total
			University of Ibadan	Ladoke Akintola University of Technology	
sex	male	Count	130	174	304
		% of Total	36.1%	48.3%	84.4%
	female	Count	30	26	56
		% of Total	8.3%	7.2%	15.6%
Total		Count	160	200	360
		% of Total	44.4%	55.6%	100.0%

There are more male participants than female participants. 15.6% of the participants are female. There are more male participants in the control group than the test group, while the female participants are about the same.

Table 20

**sex \* when first use Internet Crosstabulation**

			when first use Internet					Total
			1999	2000	2001	2002	0	
sex	male	Count	5	91	169	37	2	304
		% of Total	1.4%	25.3%	46.9%	10.3%	.6%	84.4%
	female	Count	2	23	23	7	1	56
		% of Total	.6%	6.4%	6.4%	1.9%	.3%	15.6%
Total		Count	7	114	192	44	3	360
		% of Total	1.9%	31.7%	53.3%	12.2%	.8%	100.0%

A high number (169 male and 23 female) started using the Internet in year 2001. This indicates that most of the participants have heard about or used the Internet during that year.

Table 21

**sex \* time prefer to browse Crosstabulation**

			time prefer to browse				Total
			morning	afternoon	night	0	
sex	male	Count	55	109	138	2	304
		% of Total	15.3%	30.3%	38.3%	.6%	84.4%
	female	Count	21	27	7	1	56
		% of Total	5.8%	7.5%	1.9%	.3%	15.6%
Total		Count	76	136	145	3	360
		% of Total	21.1%	37.8%	40.3%	.8%	100.0%

The gender distribution of the time participants prefer to browse indicates that most female prefer to browse during the day, while the male prefer night. A significant relationship was determined between gender and the time they prefer to browse. The significant relationship is pronounced in the test group.

Table 22

**sex \* days per week on Internet Crosstabulation**

			days per week on Internet						Total	
			0	1	2	3	4	5		6
sex	male	Count	3	11	110	113	30	30	7	304
		% of Total	.8%	3.1%	30.6%	31.4%	8.3%	8.3%	1.9%	84.4%
	female	Count	1	2	28	15	6	4		56
		% of Total	.3%	.6%	7.8%	4.2%	1.7%	1.1%		15.6%
Total		Count	4	13	138	128	36	34	7	360
		% of Total	1.1%	3.6%	38.3%	35.6%	10.0%	9.4%	1.9%	100.0%

Gender does not have any impact on the number of days per week spent on Internet browsing. However, most (%) participants browse the Internet at least twice a week. There was no statistical difference between the two groups in their frequency of Internet browsing.

Table 23

**sex \* Department Crosstabulation**

			Department					Total	
			CSC	Mathematics	Physics	Civil	Mechanical		Others
sex	male	Count	63	61	58	59	60	3	304
		% of Total	17.5%	16.9%	16.1%	16.4%	16.7%	.8%	84.4%
	female	Count	32	9	7	4	2	2	56
		% of Total	8.9%	2.5%	1.9%	1.1%	.6%	.6%	15.6%
Total		Count	95	70	65	63	62	5	360
		% of Total	26.4%	19.4%	18.1%	17.5%	17.2%	1.4%	100.0%

Table 23 supports the affirmation that there are more male than female participants. The distribution by department shows that the Department of Computer Science has the largest female participants and the control group, the largest male population.

Table 24a

	university group	N	Mean	Std. Deviation	Std. Error Mean
test 2 score	University of Ibadan	160	68.79	7.78	.62
	Ladoke Akintola University of Technology	200	53.91	7.41	.52
test1 score	University of Ibadan	160	59.16	7.94	.63
	Ladoke Akintola University of Technology	200	60.17	8.65	.61

Table 24b

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Mean	
									Lower	Upper
test 2 score	Equal variances assumed	.233	.629	18.513	358	.000	14.88	.80	13.30	16.46
	Equal variances not assumed			18.413	333.298	.000	14.88	.81	13.29	16.47
test1 score	Equal variances assumed	.484	.487	-1.145	358	.253	-1.01	.89	-2.75	.73
	Equal variances not assumed			-1.156	351.279	.248	-1.01	.88	-2.74	.71

Table 24 shows by the values of mean for the pre and post- test scores that the control group had a better performance in the pretest than the test group by a marginal difference. The posttest results (test2 score) however show that the performance of the test group improved and is significantly better than that of the control group. The improvement in the posttest results of the test group shows that the Internet access had an impact on them academically.

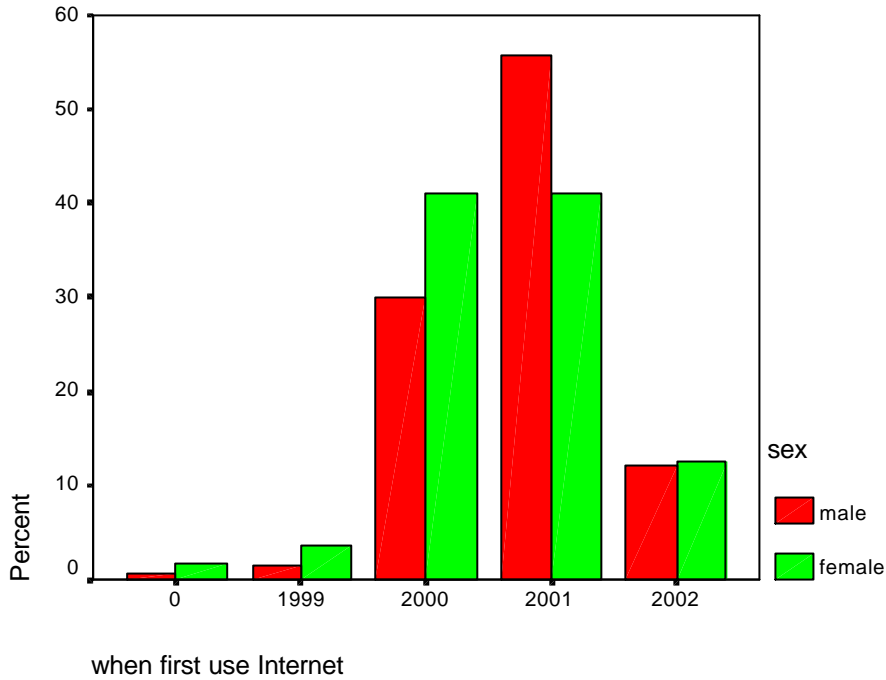


Fig. 1 Bar chart showing gender distribution for first Internet use

Fig 1 shows that the years 1999, 2000 and 2002 had more female participants using the Internet for the first time, while year 2001 had more male participants.

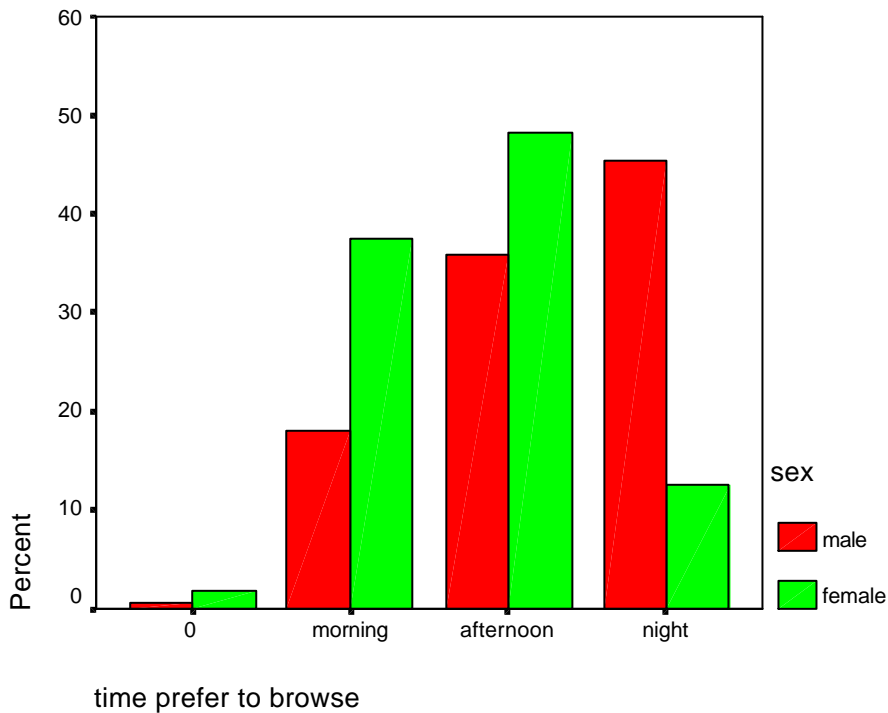


Fig. 2: Bar chart of preferred browsing time by gender

Fig 2 shows that the female participants prefer browsing during the day, while a high percentage of the male prefer night browsing. Male participants may prefer night browsing because the charges are cost effective and there is more time available.

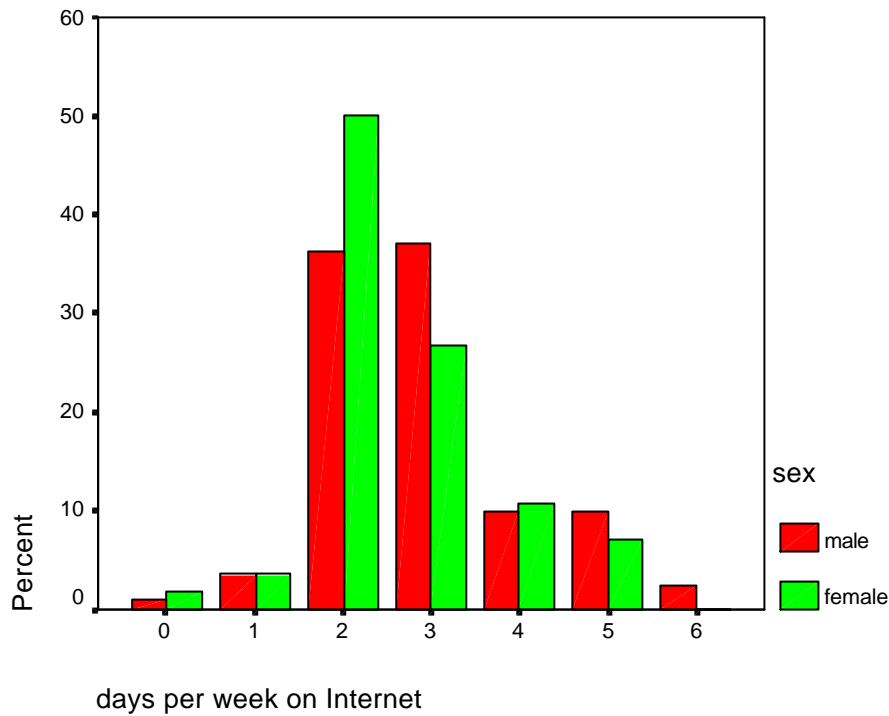


Fig 3: Bar chart of number of days per week spent browsing

Fig 3 indicates that most participants browse the Internet at least twice a week. The male participants show evidence of everyday usage.

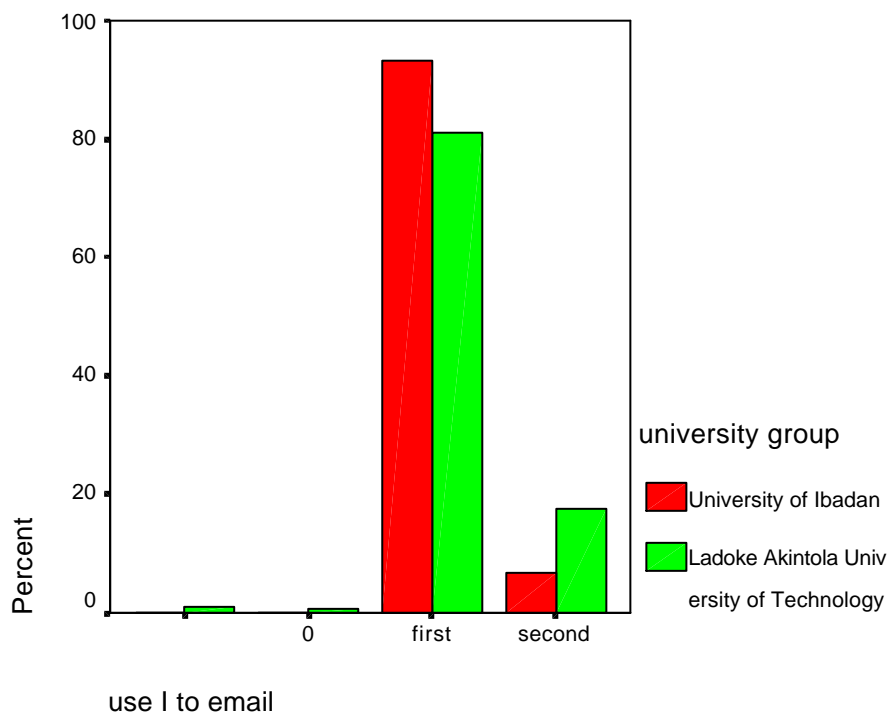
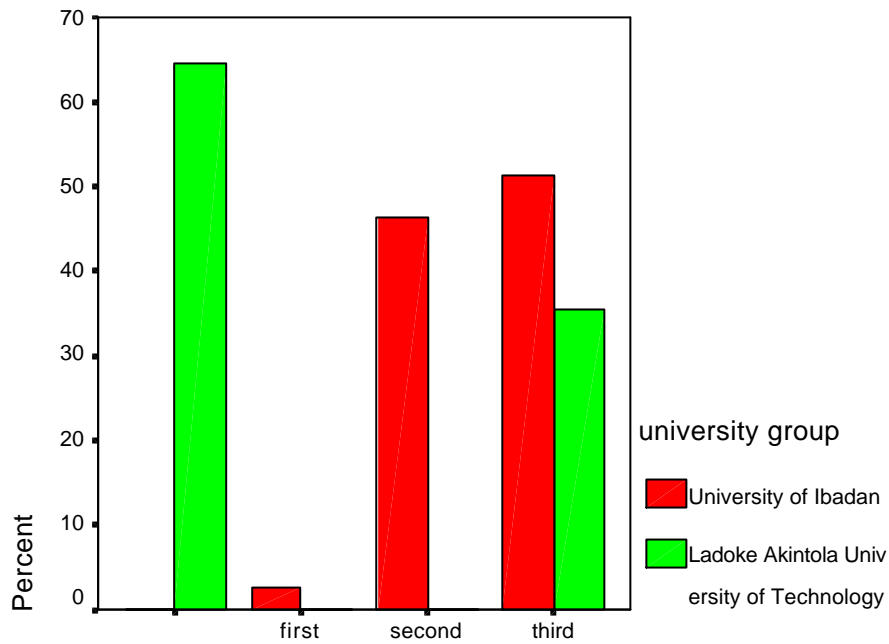


Fig 4: Bar chart showing use of Internet for email by group

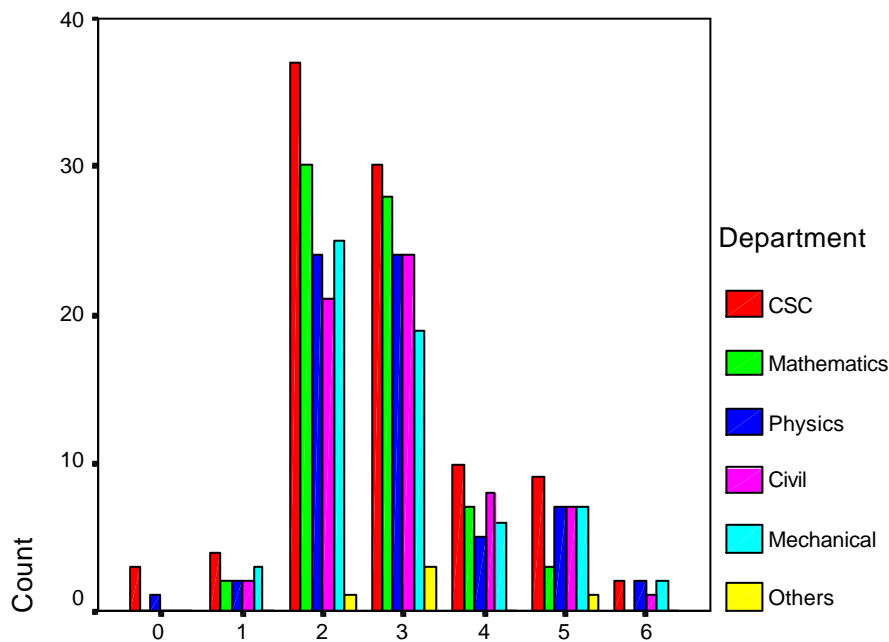
Fig 4 shows that the test group leads in their ranking of the use of the Internet for email first.



use I to do school work

Fig 5: Bar Chart showing how the groups ranked use of Internet for Schoolwork

Fig 5 shows that the control group did not rank the Internet as being useful for schoolwork.



days per week on Internet

Fig 6: Clustered Bar chart showing frequency of Internet use by Department

Fig. 6 shows that Computer Science students are constant users of the Internet. They spend the most number of days on the Internet browsing.

## **Recommendation**

Students should pay for use of the Internet facilities provided by the University. The payment and payment method should be made attractive and easy for the students.

The Internet 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 Internet access.

A central Internet access point or cyber café should be dedicated for student use. This point should be well equipped to meet the student population. The management of the Internet access point can be contracted out to a private entrepreneur or managed by a competent committee. Appropriate billing systems should be put in place.

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.

For the communication needs of the students, they should be allowed to maintain their free web-based email addresses. Providing and maintaining email addresses for students is a daunting task and would distract the Internet Administrators from their major tasks.

To provide access to the Internet 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.

## **Conclusion**

The results from this experimental study show that there is a significant difference in the academic performance of students with Internet access and those without. This thus proves the null hypothesis wrong. The posttest results for the test group after Internet access was significantly better than that of the control group.

Communication will still rank first on students use of the Internet, but with lecturers using it as a supplement to classroom teaching and as an information source, the students will utilize the Internet more for information retrieval on academic and professional issues.

Students are capable of paying for Internet access, thus their use of the Internet should be charged at a competitive rate. The funds from Internet browsing charges should be used to maintain and improve the Internet facilities.

The Internet can be used to advantage for knowledge acquisition purposes by serving as an alternative to scarce and outdated books. Instructors or Lecturers should refer students to educational websites for more information.

Internet 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.

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## Appendix I

### **ERNWACA 2002 SMALL GRANT PROJECT**

### **“AN EVALUATION OF THE IMPACT OF INTERNET BROWSING ON STUDENTS’ ACADEMIC PERFORMANCE AT THE TERTIARY LEVEL OF EDUCATION IN NIGERIA”**

#### **REGISTRATION FORM**

Instructions: Please tick ( ? ) the appropriate response.

1. Matriculation Number: .....
2. Entry mode: JAMB/UME ? Direct Entry? Transfer?
3. Department: .....
4. Level: 300 ? 400 ? 500 ?
5. Age: 16-20? 21-25? 26-30? Above 30?
6. Sex: Male ? Female?
7. Email address .....@.....
8. Do you use the Internet? Yes? No?
9. When did you first use the Internet? 1999? 2000? 2001? 2002?
10. Number (1,2,3) in order of priority the purposes you use the Internet?
  - ~~??~~ To obtain information
  - ~~??~~ To communicate by email
  - ~~??~~ To do School work
  - ~~??~~ To subscribe/apply
  - ~~??~~ Others (specify) .....
11. How do you usually fund your Internet browsing?
  - ?? I browse free ?
  - ?? My friends pay ?
  - ?? I pay ?
  - ?? Others (specify) .....
12. What time of the day do you prefer to browse the Internet?
  - Morning ? Afternoon ? Night ?
13. Do you get any information relevant to your course while browsing the Internet? Yes ? No ?
14. If yes, how often? .....
15. For how many days and for how long do you browse the Internet in a week?  
.....days .....hours .....minutes.