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Factor Analytic Study of Internet usage by Lecturers in Nigerian Institutions of Higher Learning

By Owoyemi Toyin Eunice & Abayomi Toluwalope
University of Lagos, Nigeria

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Data were collected from 220 Lecturers of higher institutions in Ondo State, Nigeria. A 30-item questionnaire was designed based on different purposes of internet usage. The questionnaire used Likert scale structured questions on internet usage; the questionnaire was validated and also confirmed reliable (Croubach Alpha 0.67). The findings of the study revealed that 7 factors constitute the dominant influence internal attributes on internet usage. Based on the findings, it was recommended that Lecturers in Nigerian tertiary institutions should undertake mandatory training and retraining on ICT programmes to provide them with practical and functional knowledge of computer, internet and associated area of ICT with the hope of integrating it with the curriculum and instructional methods/strategies in teachinglearning process.

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Factor Analytic Study of Internet usage by Lecturers in Nigerian Institutions of Higher Learning

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I. Introduction

The dissemination of Information and communication technologies (ICTs) in overall society is yielding different kinds of transformations. The school environment, as a part of the social system is not beyond these transformations derived from the inclusion of the technologies. In fact, since few years back and from different institution setting, action plans are being set, as a last resort in order to establish the adequate use of these technologies as much in questions of didactic and practical application as in those referred to its deontology; and thus, to adapt to new social requirements. The change that brought about new technologies has a significant effect on the way people live, work, play and transacts business and diffusion of information.

Hence, the new technologies challenge the old or traditional form of teaching which was chalk and talk method and the way education is managed. Information and communication technologies (ICTs) have impacted the educational sector of the world, though it is accepted that the rate of deployment of new technologies has been lower in developing countries, especially those of sub-Saharan Africa. There have been fundamental differences in the way educational change towards technology has been approached and implemented between developed and developing countries(Naidoo & Schutte , 1999). For the latter, emphasis has largely been on the physical infrastructure, such as telecommunications sector development, purchase of hardware, developing electronic networks and so on and there has been less emphasis on training of educators.

In education industry just like other sectors, Information Technology (IT) focuses on electronic generation, storage, retrieval, utilization and protection of information for future use while ICT revolves around different type of technologies likely going to be utilized for processing, transmitting or communicating information.

ICT has been described as any equipment or interconnected system of equipment that is used in let automatic acquisition, storage, manipulation, management, control, display, switching and transmission of information. Communication itself is a process of exchange of information ideas between two or more individuals with the purpose of bringing about a change in behavior (Adebayo, 2007). In this context ICT are tools that comprise electronic devices which are utilized for information and communication needs of institution, organization, students and individuals. Such electronic devices include computer (Hard and soft ware), networking, telephone, video, multimedia and internet.

Application and utilization of these devices converts information, text messages, sound and motion to common digital form. ICT provides students and teacher with practical and functional knowledge of computer, internet and other associated area of ICT. In the classroom situation, through interaction, ICT is an integral component of school curriculum activities since some of this curricular activities, tasks teacher/students undertake involve the use of communication skill both oral and written information. For instances, in all science subjects, students record their practical,

Author α : University of Lagos, Akoka, Lagos State, Nigeria.
E-mail : toyinowoyemi2006@yahoo.com
Author σ : Adekunle Ajashin University Akungba-Akoko, Ondo State, Nigeria. E-mail : tolu3030@yahoo.com

experiments, observations, demonstrations in both formal and informal text or present their findings/discovering in either oral or written reports. Therefore, to prepare students for information age and competitiveness and communicate effectively in the 21st century, complete internet/intranet services need to be made available in all schools in Nigerian.

The world economy today is increasingly becoming information and knowledge based. The emerging information and knowledge economy is enhanced by ability to identify the source of information, quick and easy access to the source, and swift translation of the acquired information into production, creative ventures and wealth.

The country also desires to use IT (internet) to create wealth, alleviate poverty, job creation and global competitiveness. As part of the country's mission, a policy has been put in place to encourage massive acquisition of both local and global IT skills. Between 1990 and to date, a great deal impetus has been put to IT development in Nigeria. Some state governments are embarking on e-government which is internet facilitated (Orhuozee, 2002). Also e-economic is fast expanding. Banks in their bids to deliver quality services and expand their reach are taken grant strides into e-banking (Otokhline, 2002). More importantly, the government of Nigeria has put all needed resources in place to make all universities internet oriented.

In the recent times particularly after the exit of military dictatorship in Nigeria, Internet Service Providers (ISP) has increased in number tremendously. Also, many of cyber cafes have spring up to avail Nigerians the benefits of internet. In order to stop the decline of the Nigerian Educational System occasioned by the introduction of satellite campuses, the satellite campuses were cancelled and replaced with Distance learning (DL). A major pivot of the Distance Learning is e-learning (internet).

The entire universe has been transformed to a global village through Information and Communication Technology (ICT), which in a way has produced the internet facility. Gone are the days of hypodermic needle method of teaching when teachers and academic practitioners saw themselves as knowledge oracles and sage of the stage, delivery data, information, knowledge to eager students whose minds are simply-empty vessels wanting to be filled (Ajayi, 2001). Information and Communication Technology has broadened the horizon of the opportunities among institutions of higher learning, giving hopes to the academic communities to cooperate with their counterpart all over the word, (Collin & Wende, 2002; OECD, 2005)] strengthened their mandates of teaching and carrying out research (CHEPS, 2000). The use of ICT particularly internet has taken learning beyond what it used to be, stretching this beyond the classroom limit, ensures adequate participation in teaching with the prospect of creating virtual environment to experiment and explore. There is no doubt, internet has offered a wide array of choices and innovative ways that it now mostly absent in the traditional classroom.

The Internet provides several opportunities for the academia. It is a mechanism for information dissemination and a medium for collaborative interaction between individuals and their computers without regard for geographic limitation of space (Liener, Cerf, Clark, Kahn, Kleinrock, Lynch, Postel, Roberts & Wolff, 2000; Singh, 2002)]. Content created on the Internet ranges from simple e-mail messages to sophisticate 'documents' (sites) incorporating sounds, images and words. The Internet is arguably one of the most significant technological developments of the late 20th century and most literature is directed at the Internet as a tool for educators.

As (Rosenberg, 2001) remarked, the Internet is the most remarkable technological breakthrough of the 1990s. Undoubtedly the Internet is, and will continue to play an important role in transforming higher education itself, just as the schools have contributed in remarkable ways in generating new technologies in ICT, life sciences, and biotechnology. The vast information on the Internet that covers almost all areas of human endeavors has made Internet the greatest achievement of the century.

The need for greater usage of ICT, particularly the Internet, has engendered several development policies in the area of telecommunication. This is because the Nigerian government recognises the innumerable benefits inherent in the use of ICT for social, political, economical and educational purposes. This is exemplified in the strategies outlined for rapid development of Internet infrastructure, service and contents of the National Policy on Telecommunication [9]:

- Government shall encourage the provision of elaborate infrastructure required to have fast and reliable Internet access through institutional and private sector participation.
- Government shall encourage the development of Internet content that will promote the social economic and political development of Nigeria.
- Government shall continue to monitor the emerging application of the Internet in areas such as banking, telephone, as well as e-commerce and enact appropriate legislation and incentives that will encourage their use to promote rapid socio-economic development.
- Government shall promote the use of the Internet in health, agriculture, education and research and encourage private sector participation in this project.

Similarly, in the Nigerian National Policy for Information Technology (FRN, 2001) the value of

information technology in the development of the nation's rural and urban communities was stressed. The strategies to achieve this include the establishment of rural Internet resource centers with VSAT capability to provide access to IT and the Internet, and also the establishment of IT facilities in rural areas through the use of mobile internet unit.

Although ICT is penetrating every sector of the Nigerian Society, few empirical studies have been conducted on their use for socio-economic and educational purposes (Idowu, Adegunodo & Popoola, 2003; Jagboro, 2003). William (2003) had underscored the need for research on how people acquire and practice computer literacy using the framework of public computing, that is, through cybercafés.

ICT is having a revolutionary impact on educational methodology globally (Ololube, 2006). Among the internet using population, individuals ranging from 18-34 years of age represent the "most active online users" in the United States (Pastore, 2000). To this end, Nigeria as a country cannot afford to lack behind in the integration of ICT especially internet facility and its numerous offers. It has also been revealed that in Nigeria, the use of internet in educational sector is still at the rudimentary stage (Adeogun, 2007). There is a need for lecturers in our higher institutions of learning to embrace the full use of ICT in the implementation of curriculum.

It is therefore, pertinent to examine the responses of Nigerian lecturers to this stimulus in the world of communications and to investigate particularly the use to which the internet is being put. Thus, this study is geared towards examining the internet usage by lecturers in Nigeria higher institution of learning. Its focus is primarily to study the pattern of usage of internet in the academic communities.

II. Research Questions

1. What are the latent factors that can explain the observed relationships among the variables on internet usage by the lecturers?
2. What are the underlying relationships among the loaded variables on each isolated factor from lecturers' responses on internet usage?

a) Research Design

An expos-facto survey was adopted for the study. It involves the collection of data on internet usage by Lectures using an appropriate questionnaire. This design was used as there was no manipulation of the independent variables.

b) Sample

The study sample consisted of lecturers in Federal University of Technology, Akure and Adeyemi College of Education, Ondo, in Ondo State, Nigeria. These are two Federal Government Institutions in the state and all the lecturers in these two institutions were enumerated. However, those lecturers who do not use internet were not pursively not selected as part of sample. The sample consisted of 95 male lecturers and 45 female lecturers from the University and 43 male and 37 female lecturers from the College of Education making a total of 220 lecturers.

c) Instrumentation

The instrument used in the study was a Likert-type questionnaire adopted from Alase and Owoyemi (2004). The questionnaire was divided into two sessions. Section A sought for personal information of the lecturers (locality, sex, age, and if the respondent is an internet user). Section B was made up of 30 items on the usage of internet relevant to lecturers. The frequency of usage was based on 5-points Likert Scale in which the lecturers were to indicate the extent of their agreement or disagreement with each of the statements.

The instrument was pretested through a pilot survey using 20 lecturers who were internet users in Federal College of Agriculture, Akure, which is within the state. The result of the pilot survey was analysed and showed no ambiguity or misinterpretation of the concepts. The final draft of the instrument was prepared with reliability coefficient of 0.67 using Croubach alpha method.

d) Data Collection

The data were collected through the administration of the questionnaire to the targeted lecturers by the researcher. Names were not requested so that anonymity was maintained throughout the study and the questionnaires were collected back immediately from the respondents.

e) Data Analysis

Data collected were subjected to factor analysis utilizing principal components factor extraction and orthogonal rotation by the varimax criterion (with Kaiser Normalization). Principal component method of factoring was used while Kaiser-Mayer-Olkin (KMO) measure of sampling adequacy was applied to test whether the partial correlations among variables are small. Bartlett's Test of specificity was carried out to confirm multicolinearity between the variables. It examined whether the correlation matrix is an identity matrix. The principal components extraction was rotated to the terminal solution while varimax criterion was applied so as to delineate the pattern of variation in the variables rather than among users. Absolute values of coefficients that are less than 0.300 were suppressed. This implies that only factor loadings of 0.300 and above are assumed to be interpretable.

III. Results and Discussion

The table 1 shows the result of the extracted factors using principal component analysis. The factors accounted for 66.02% of the total variance. This implies that there are seven substantively meaningful uncorrelated pattern of relationship among the variables.

Table 2 shows the results of the Total Variance Explained by the extracted factors and the analysis of each of the 7 factors clusters of items proffers a recipe for naming the factors. These clusters of items are given in Table 3 below.

IV. Web – Design Factor

The variables that load significantly high on the factor are mostly the variables that deal with web development, teleconferencing, file transfer (FTP), and Design and Engineering Information. Web development has a loading of 0.879 and the common factor which produced the highest variance in the data set explained 15.449% of the total variance in usage pattern of the internet. Each of the variables that loaded on the factor has a correlation (r): $0.436 \leq r \leq 0.879$ with the factor. This factor has dominant influence because the major focus of the group of lecturers is web – design.

a) Travelling Information Factor

This factor accounted for 12.948% of the total variance explained. There are four variables that loaded significantly high on the factor and all deal with travelling issue. The factor generated 81% of the variation in Hotel reservation, 80.8% weather forecast, 79.4% in Browsing for aviation information and 57.8% in Tourism information. It has correlation (r): $0.413 \leq r \leq 0.810$ with the variables that loaded on it. That their factor is the second influential factor is not surprising because the lecturers at the 21st century want to be connected and also needs to attend conferences/workshops to develop themselves both at home and abroad.

b) Entertainment Factor

Factor 3 accounted for 8.292% of the total variance explained one of the variables deals with general entertainment (music & movies) which has a correlation $r = 0.757$ with the factor, others deal with Health information (0.714) and Sport (0.577). At this stage of life, individual lecturers are very inquisitive about their health. Research has shown that entertainments such as sport have a direct relationship with health.

c) On-Line Purchase Factor

All the variables on the factor are concerned with on-line purchase (0.710), seeking information on retail stores (0.704) and searching for new books in retail store.

d) Scholarship/Employment Factor

The two variables that loaded on the factor are seeking for aids/scholarships (0.852) and seeking for employment (0.843). This factor explained 7.959% of the total variance and it is the 5th orthogonal construct in the usage profile.

e) Research Factor

This factor accounted for 7.777% of the total variance explained and ranked as 5th in the usage pattern. All the variables deal with research and seeking for information on acquisition of knowledge. The factor generated 69.3% of the variation in research work and 67.9% in learning and broadening of knowledge. This is supported by a statement that internet is a tool for acquiring knowledge (Jagboro, 2003).

The importance attached to online information is also confirmed by assertion that "over the years, I've learned far more online about how things really work than I learned about how things should work in theory in six years of higher education as an undergraduate and graduate student"[6]. Hence, cyberspace becomes the virtual library and the fount of all knowledge. But it is surprising that lecturers use the internet seldomly for this purpose and this is a serious signal to Nigerian government that drastical step needs to be taking to make development and provision of necessary ICT facilities available in all our higher institutions .

f) Pornography Factor

This latent factor explained 5.344% of the total variance in the internet usage pattern. Each of the variables that load on the factor has a correlation r: $0.368 \leq r \leq 0.783$ with the factor. Watching pornographic films has the highest loading and this is one of the unwholesome aspects of internet use (IME.2002).

V. Conclusion

The study showed that seven factors determine and influence the usage of internet among lecturers in the higher institutions in Nigeria. Out of these factors web design, travelling, entertainment and online purchase exhibit the greatest variability, others identified factors are scholarship/employment, research and pornography. For scholarship/employment and research coming up as the 5th and 6th factors should facilitate a serious and genuine concern why there should provision for internet facility and training/retraining programmes for lecturers in all Nigerian institution of higher learning to create more awareness of the importance of internet and to equip them with the necessary skills so that maximum and wholesome usage can be derived out of this evolving technology. Also, through workshops/conferences they

will be acquainted with practical and functional knowledge of computer, internet and associated area of ICT with the hope of integrating it with the curriculum and instructional materials/strategies in teachin/learning process. If truly Nigeria wants to become an IT super power in Africa by year 2020 these factors that influence internet usage should be properly addressed and improved upon. The fact that the respondents are lecturers, the usage of internet is very much significant to their performance because academic tasks are strongly associated to computer use in this age of technological advancement. ICT therefore, in education is an indispensable tool in the modern teaching-learning process; hence the right usage will go a long way to enhance effective teaching and learning.

Table 1 : Rotated Component Matrix

	Component						
	1	2	3	4	5	6	7
V5					.843		
V6					.852		
V7		.361		.704			
V8				.710			
V9							.783
V10				.596			
V11			.577				.424
V12						.693	
V13						.549	
V14				.376		.679	
V15			.757				
V16			.714				-.368
V17	.436	.413	.375				
V18	.636						
V19						.525	
V20		.573					
V21		.794					
V22		.808					
V23		.810					
V24	.706						
V25	.792						
V26	.879						
V27	.806						

Extraction Method: Principal Component Analysis

Table 2 : Total Variance Explained

Component	Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %
1	3.553	15.448	15.448
2	2.978	12.948	28.395
3	1.907	8.292	36.687
4	1.898	8.254	44.942
5	1.831	7.959	52.901
6	1.789	7.777	60.678
7	1.229	5.344	66.022

Extraction Method: Principal Component Analysis

Table 3 : Clusters of Loading for Internet usage Profile

Factor	Name	Loading	Statement on the instrument
1	Web Design	.436	Legal constitution
		.636	Discussion and Debate on News group
		.706	Design and Engineering information
		.792	File Transfer (FTP)
		.879	Web Development
		.806	Teleconferencing
2	Travelling Information	.361	Seeking information on retail store
		.413	Legal consultation
		.578	Tourism information
		.794	Browsing for aviation information
		.808	Weather forecast
		.810	Hotel Reservation
3	General Entertainments	.577	Watching Sport
		.757	Music and Movies
		.714	Health
		.375	Legal consultation
4	Online Purchase	.704	Seeking information on retail store
		.710	Online purchasing from shops
		.596	Searching for New Books
		.376	Learning and broadening of knowledge
5	Scholarships/Employment	.843	Seeking for employment
		.852	Seeking for Aids, Scholarship or Assistantship
6	Research	.693	Research Works
		.549	Collecting information for research purpose
		.679	Learning and Broadening of Knowledge
		.525	E-mail
7	Pornography	.783	Watching pornography films
		.424	Watching sport
		.368	Health information

References Références Referencias

1. Adebayo, F. A. (2007). *Management information system for managers*. Ikeja, Lagos. Atlantic Associated Publishers.
2. Adeosun, O.A. (2007). *Managing e – learning to achieve education for all in Nigeria*. A paper presentation at 12th Cambridge International Conference on Open and Distance Learning. London.
3. Ajayi, O. (2001). Highlights of best practices in IT-assisted teacher are training. In: Isyaku, K., Anikiroze C.M., Maiyanga A.A., and Olokun, M. (Eds). Teacher Education in the Information Technology Age: National Commission of Colleges of Education.
4. Alese B.K. and Owoyemi, S. O. (2004). Factor analytic approach to internet usage. *Journal of Information Technology Impact*. 4 (3), 171-188.
5. Brabazon, T. (2001). "Internet teaching and the administration of knowledge," Available http://www.firstmonday.org/issues/issue6_6/brabaz
6. CHEPS (2000). *Higher education and the stakeholder's society*. Research Programme for 2001 – 2005.
7. Collin, B. and Wende, M. V. D. (2002). *ICT and the internationalization of higher education*.
8. Federal Republic of Nigeria (FRN).(2001). *Nigeria national policy for information Technology (IT)*.Use IT. Retrieved December 3rd 2003, from http://www.nitda.gov.ng/docs/policy/ngitpolicy.pdf
9. Jagboro, K. O. (2003). *A study of internet usage in Nigerian universities: A case study of Obafemi Awolowo University, Ile-Ife, Nigeria. First Monday*,8 (2) Retrieved July 3rd, 2003. Available http://firstmonday.org/issues/issue8_2/jagboro/index.html
10. Idowu, P.A., Adagunodo, E. R. & Popoola, B. I. (2003). *Computer literacy level and gender.* differences among Nigerian university staff. *The African Symposium*, vol.3 no. 3.
11. Retrieved December 3rd, 2003, from http://www2.ncsu.edu/ncsu/aern/comlit.pdf IME, Internet Made Easy. 2002. Paragon publishing house, 36-70.
12. Leiner, B. M., Cerf, V.G., Clark, D.D.;, Kahn, R.E., Kleinrock, L., Lynch, D.C., Postel, J., Roberts, L. and Wolff, S. 2000. "A brief history of the Internet," Availablehttp://www.isoc.org/internet/history/brief.shtml.

13. Naidoo, V. and Schutte C. (1999). Virtual institutions on the African continent, in G. Farrel (ed.) (1999) *The Development of Virtual Education: A Global Perspective*, pp. 89-124
14. OECD. (2005). "E – learning in tertiary education: Where do we stand?" *Education and Skills.*.4 (1), 1 – 293.
15. Ololube, M.P. (2006). Appraising the relationship between ICT usage and integration and Standard of Teacher Education Programme in a developing Economy. *International Journal of Education Development using ICT.* 2 (3).
16. Orhuozee, E. (2002). More promising E-governance strides in Nigeria. PC World West Africa, August Edition, IT Media group, 6 – 7.
17. Otokhine, E. (2002). N*igeria moves forward with E-banking*. PC World West Africa, January Edition, IT Media Group 4-7.
18. Rosenberg N. (2001). Challenges to the social sciences in the new millennium, in *Social Sciences and Innovation*, Paris,OECD.
19. Pastore, M. (2000). Demographics of the net getting older. Retrieved May 12, 2002, Available http://cyberatlas.internet.com/bigpicture/demographics/articls/0,5901_448131,00html.
20. Salih, U. (2003). Educational uses of internet in the world and Turkey. *Turkish Online Journal of Distance Education-TOJDE*I.4 (3).
21. Singh, A.M. (2002). "The Internet — Strategy for optimum utilization in South Africa," *South African Journal of Information Management.,* 4, (1).
22. Williams, K. (2003). Literacy and computer literacy: analyzing the NRC's being fluent with information technology. *The Journal of Literacy and Technology*, vol.3 no.1. Retrieved December 3rd, 2003, from http://www.Literacyandtechnology.org/v3n1/williams.htm