GLOBAL JOURNAL OF MATHEMATICAL SCIENCES, VOL 2, NO. 1, 2003: 57-63
 ISSN 1596-6208

USE OF INFORMATION TECHNOLOGY BY ACADEMICS IN SELECTED UNIVERSITIES IN NIGERIA.

OKON ANI and JACOB ESIN

(Received 2 July 2002; Revision accepted 31 December, 2002).

ABSTRACT

This study investigates the extent and level of use of information technology (IT) by academics in selected universities in Nigeria. Five Federal universities were used for the study; and data were collected using questionnaire survey. Three parameters were used to measure the extent of use of computers: percentage of academics who used computers, variety of academic application areas in which computer is used, and various uses of available computer software packages. The level of use of computers was measured in terms of computer experience, frequency of use, and accessibility to computers. The study results show that computers were extensively used by the academics, while the level of use of computers was very low. There was negligible use of networking and Internet. Major obstacles to effective use of information technology include lack of access to IT, inadequate skills in use of computers, and incessant power supply. The study concludes that, use of IT is a recent development in these universities, and recommends provision of computers to academics with corresponding training programmes to enable them acquire adequate skills and knowledge of computer potentials.

Keyword: Computer, software, Internet, computer experience, information technology

INTRODUCTION

National development is a continuous process of evolving a condition or state whereby the citizens of such a country have access to basic needs of life, such as food and good health systems. The role of information in national development is apparent as the availability of relevant information enhances the quality of national policy formulation mechanism (Lefebvre and Lefebvre, 1996). Access to, and the proficiency in the manipulation of information defines in part the citizen of modern democratic state (Martinez, 1994). The importance of universities in national development cannot be overemphasized; since two-thirds of the country's information generation (or research) is done in our universities (Aniche, 1997). Hence, there is a need to improve the conduct of university's research in Nigeria.

Given the centrality of computers to information flow, the use of information technology (IT) to facilitate research becomes indispensable. Information technology is defined as the use of computer and telecommunications for the processing and distribution of information in digital, video and other forms (Morris, 1992). Put differently, IT is concerned with generation and dissemination of information using computers and telecommunications. And most often than not, IT is used synonymously with computer applications. Lagenberg (1994) is of the view

OKON ANI, Department of Library, University of Calabar, Calabar, Nigeria
JACOB ESIN, Department of Geology, University of Calabar, Calabar, Nigeria

that universities should integrate IT with their traditional missions of teaching and research. Recent developments in IT are said to have significant implications on research (Clarke, 1994).

PREVIOUS RESEARCH

Research have been carried to investigate the use of IT by academics in universities (Al-Shanbari and Meadows, 1995; Liebscher et al, 1997; Philip, 1995, 1996; Rolinson et al, 1995). Al-Shanbari and Meadows (1995) studied the use of computers among scientists and engineers in four universities in Saudi Arabia. Since the intention was to examine the communication habits of statistically significant sample of scientists and engineers in Saudi Arabia the approach adopted was to employ a questionnaire survey (Al-Shanbari and Meadows, 1995). Philip (1995, 1996) investigated the extent of use of computers and information systems by academic chemists in UK. In their study, Rolinson et al (1995) surveyed the usage of computers and related factors by biological researchers. Thus the need to investigate the use of IT in various institutions is an attempt in keeping with political, social, economic and professional impacts and implications of emerging information superhighway (Gilchrist, 1995). In their study, Ng Tye and Çhau (1995) have used three parameters to measure the extent of use of computers: percentage of academics that use computers in teaching/research, variety of academic application areas in which computers are used, and various uses of available computer software packages. The level of use of computer was measured in terms of computer experience, frequency of use of computers, and accessibility to computers.

In Nigeria, the National University Commission NUC, Abuja, carried out a feasibility study to ascertain the position of IT, telecommunications and computing facilities in Federal universities (Olayi, 1997). The aim was to work out the feasibility of linking all Federal universities through a computer network, called National Universities Network (NUNET). Thus the findings of this study will be of immense value to NUC to implement NUNET and university administrations in order to improve the quality of university education and research in Nigeria.

RESEARCH METHOLOGY

The research methodology adopted in this study was the questionnaire survey. A total of 241 questionnaires were administered in five Federal universities in Nigeria: University of Ibadan (Unibadan), Ibadan, University of Lagos (Unilag), Lagos, University of Calabar, (Unical), Calabar, University of Uyo (Uniyo), Uyo, and Federal University of Technology,

Table 1 Faculties/Departments of respondents.

University	Faculty	Department
Unibadan	Science Law	Physics./Chemistry/Mathematics. Constitutional law/Law of contract/civil law
Unilag	Engineering Social Science	Chemical eng./Mechanical eng./Civil eng. Economics/Geography/Political science.
Unical	Med/Surgery Agriculture	Physiology/Biochemistry/Anatomy Agric.econs/Animal science/Crop scene.
Uniyo	Education Arts.	Guidance and counselling./Technical edu./Special edu. Philosophy/Communication art/Religious studies.
Futo	Engineering Science	Electrical eng./Mechanical eng/Production eng. Mathematics/Biology/Geology

Owerri (FUTO). The major factor that influenced the choice of these universities was economic reason. Face-to-face survey was adopted due to its high response rate (Rolinson et al, 1995). The sampling method used to select academic faculties/departments of the respondents was stratified random sampling (Osuala, 1982). Two faculties and three departments were selected from each university as shown in Table 1.

A total of 142 (58.9%) duly completed and usable questionnaires were retrieved and used for data analysis (returned and non-usable questionnaires were 18 (7.5%) while 81 (33.6%) questionnaires were not returned at all).

RESULTS OF THE STUDY

Working Experience of Respondents

Table 2 indicates that the largest group of respondents had below 10 years (50.0%) of working experience, followed by respondents between 11 and 15 years (28.9%) working experience.

Table 2 Working experience of respondents

Working Experience (Year)	Response (%)
Below 10	50.0
Between 11 and 15	28.9
Between 16 and 20	12.7
Above 20	7.7

Extent of Use of Computers

In this study, the respondents were asked if they do make use of computers in any aspect(s) of their teaching/research work. And 61.3% of the respondents indicated that they used computers in teaching/research work.

The respondents were also asked to choose from the list of tasks, Table 3, those that they have been using computers to perform. The results show that majority of the respondents used computers for statistical analysis (44.4%) and word processing (401.1%). It was found that 2.1% of the respondents used computers for unspecified tasks i.e. "other" tasks mentioned in this option include medline search and solving special engineering problems.

Table 3 Tasks performed with computers by respondents.

Task	Response (%)
Collection of data	19.7
Statistical analysis	44.4
Graphical displays	26.1
Drawing plan for field experiment	6.3
Storage data for experiment	23.3
Simulation/modeling	12.7
Software development	14.1
Record keeping	23.9
Word processing	40.1
CD-ROM search	9.9
E-mail	4.2
Other	2.1

Note that total percentage response is greater than 100% since each respondent ticked more than one task.

The respondents were asked to list various computer software packages they used in teaching/research work. The listed software packages were categorized as shown in Table 4. Programming languages (81.4%) were the most extensively used software packages among the academics.

Table 4 Computer software packages used by respondents.

Software package	Response (%)
Programming language	81.4
Spreadsheet	28.6
Word processing	18.6
Statistical package	5.7
Window based application	4.3
Graphics	2.9

Note that total percentage response is greater than 100% since each respondent used more than one software package.

Level of Use of Computers

In Table 5 the results of computer

experience of respondents are depicted. The majority of the respondents have below 5 years (58.0%) of computer experience.

Table 5 Computer experience of respondents

Computer Experience (Year)	Response (%)
Below 5	58.0
Between 6 and 10	29.5
Between 11 and 15	6.8
Between 16 and 20	1.1
Above 20	4.5

In terms of frequency of use of computers, the results of this study (Table 6) indicate that, most of the respondents used computer "occasionally" (40.1%), only very few used computers weekly (9.9%) and daily (5.6%).

Table 6 Frequency of use of computers by respondents.

Frequency	Response (%)
Daily	5.6
Weekly	9.9
Monthly	0.7
Occasionally	40.1
Rarely	20.3
Never	23.4

The findings in Table 7 on accessibility to computer systems show that, commercial computers (55.6%) were mostly used by the respondents. In option "other" (1.4%), respondents had mentioned that, they only made use of computers in the National Mathematical Centre, Abuja and universities overseas.

Table 7 Computer systems used by respondents.

Computer System	Response (%)
Your own personal computer	12.7
Departmental computer	13.4
University's computer center	28.2
Commercial computer	55.6
Other	1.4

Note that total percentage response is greater than 100% since each respondent ticked more than one system.

Obstacle to Effective Use of Computers by Academics

Lack of access to computers has been identified as the major obstacles to the effective use of Computers by the respondents as shown in Table 8. Other obstacles include inadequate skills in use of computers (43.0%) and incessant power failure (34.5%).

Table 8 Obstacles to effective use of computers by respondents.

Obstacle	Response (%)
Inadequate skills in use of computers	43.0
Lack of /little awareness of computers potentials	28.2
Lack of access to computers	71.1
Non-availability of required computer software	23.3
Non-availability of technical staff for immediate assistance	17.6
Constant breakdown of computer system	14.1
Poor maintenance culture	15.5
Cost of maintaining computer systems/procurement	16.2
Incessant power failure	34.5

Note that total percentage is greater than 100% since each respondent ticked more than one obstacle.

Use of Computer Network and Internet

Questions were asked to investigate the use of computer network and Internet in these universities. The study results show that only 4.9% and 6.3% of the respondents used computer networks and Internet respectively in their teaching/research, in other words vast majority of the respondents were non-users of computer networks and Internet.

DISCUSSION

The results on the use of computers show that 61.3% of the respondents professed to use computers in their teaching/research work. The findings also show that academics made wider applications of computers in performing variety of academic tasks, besides various application software packages that have been used. Thus these three parameters show that, the extent of use of computers in the universities involved was high.

Statistical analysis (44.4%), word processing (40.1%) and graphical display (26.1%) have been the major tasks that academics used computers to perform in their teaching /research work. The high use of computers on statistical analysis by academics is based on the fact that, the use of statistics in research virtually cuts across all academic disciplines. The high usage of computers on statistical analysis is consistent with the findings of Liebscher et al (1997). Ng Tye and Chau (1995) and Rolinson et al (1995) had reported similar findings, except that word processing came ahead of others. The inextensive use of CD-ROM and E-mail can simply be explained in terms of non-availability and lack of awareness of these facilities.

In this study, the level of use of computers was measured in terms of computer experience, frequency of use of computers, and accessibility to computers. Majority (57.7%) of the academics that used computers in their teaching/research have below 5 years of computer experience. The second indicator, frequency of use, shows low level of use of computers i.e. academics used computers occasionally (less frequently). And thirdly, the study results also show low level of accessibility to computers by the academics. Consequently, the level of use of computers was low in the surveyed universities as indicated by these parameters.

The major obstacles to effective use of computers include lack of access to computers, inadequate skills in use of computers, incessant power failure, and lack of/little awareness of computer's potentials among others. Adequate skills to use the computer can be acquired if the computers are made available to the academics to use as their working tools. Similarly, the use of networking and Internet is low in these universities apparently due to non-availability of these important information technology infrastructures for teaching/research.

CONCLUSION/RECOMMENDATIONS

The purpose of this study was to investigate the extent and level of use of computers in Nigerian universities by academics. Three indicators: percentage of academics that use computers in teaching/research, variety of academic application of computers, and various uses of available computer software packages were used to measure the extent of use of computers. The study shows that computers were extensively used by academics in the surveyed universities. In terms of level of use of computers, three parameters were also involved: frequency of use of computers, years of computer experience, and accessibility to computers. The level of use of computers was found to be low as a result of low level of frequency of use of computers, low level of computer experience, and lack of access to computers by academics.

The study identified major obstacles to the effective use of IT which include lack of access to IT, inadequate skills in use of computers, incessant power failure among others. The negligible use of computer networking and Internet implies that, there is problem of information-handling by academics in these Nigerian universities. Consequently, in this era of globalization of information, Nigerian academics must be encouraged to have access to information technology infrastructures particularly the computer networking/Internet. This is imperative, if the quality of university education and research in Nigeria must improve, and compare with that of the developed world. Hence the following recommendations will be useful in the integration of use of computers in teaching/research by academics in Nigerian universities.

1. Availability/Accessibility: Every academic department (especially the science oriented disciplines) should have a functional computer laboratory. Besides, every academic must be provided with a personal computer (or financial grant/subsidy should be given to academics to enable them to procure computers) as working tool(s).
2. Computer training programmes should be introduced and organized in Nigerian universities on the use of computers (information technology) for the benefit of all the academic staff. Orientation programmes should be conducted, workshops/seminars and periodic short courses organized. These will ensure awareness on potentials and capabilities of computers and improved skills among the academics.
3. Full implementation of introduction of compulsory computer course to all undergraduates in Nigerian university system; this will make future academics to be well equipped with computer skills and expertise. Hence the dire need to provide Nigerian academics with enabling working environment/ conditions to teach these young ones effectively.
4. Effective and efficient power (back-up system) should be provided in each university to check the menace of incessant power failure.

REFERENCES

Al-Shanbari, H. and Meadows, A. J. 1995. Problems of communication and information-handling among scientists and engineers in Saudi universities. Journal of Information Science. 21(6): 473-478.

Aniche, E. F. 1997. The role of universities in economic development. Nigerian Vanguard, 20 Feb.

Clarke, R., 1994. Electronic support for practice of research. The Information Society. 10(1):25-42.

Gilchrist, A., 1995. Editorial. Journal of Information Science. 21(2): 73-74.

Langenberg, D. N., 1994. Information technology and the university: integration strategy for the 21st century. Journal of American Society for Information Science. 45(5): 323-325.

Lefebvre, E. and Lefebvre, A., 1996. Information and technologies: the impact of their adoption on small and medium sized enterprises. International Development Research Centre, Ottawa.

Liebscher, P., Abels, E. G., and Denman, D. W. 1997. Factors that influence the use of electronic networks by science and engineering faculty at small institutions part ii. Preliminary use indicators. Journal of American Society for Information Science. 48(6): 496-507.

Martinez, M. E. 1994. Access to information technologies

among school-age children: implications for democratic society. Journal of American Society for Information Science. 45(6): 395-400.

Morris, C. 1992. Academic Press Dictionary for Science and Technology. Academic Press. New York.

Ng Tye, E. M. W. and Chau, P. Y. K. 1995. A study of information technology adoption in Hong Kong. . Journal of Information Science. 21(1): 11-19.

Olayi, G. A. 1997. NUNet and the implication for scientific education in Nigeria. Managing Information Technology in Developing Countries: Issues, Prospects and Problems (MIT '97) edited by E. R. Adagunolo (COAN Conference Series Nigeria).

Osuala, E. C., 1982. Introduction to Research Methodology. African-Fep Publishers, Lagos.

Philip, G., 1995. Use of *leading-edge* information systems by academic chemists in UK: part I, the results of a preliminary investigation. Journal of Information Science. 21(3): 187-199

Philip, G. 1996. Use of *leading-edge* information systems by academic chemists in UK: part II, constraints and the need for usability engineering. Journal of Information Science. 22(2): 93-96.

Rolinson, J., Meadows, A. J. and Smith, A., 1995. Use of information technology by biological researchers. Journal of Information Science. 21(6): 133-139.