

ASSESSMENT OF INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) SKILL ACQUISITION IN SELECTED TERTIARY EDUCATIONAL INSTITUTIONS IN KANO STATE

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Abstract

This study evaluated the adoption (skill acquisition) of computer and information technology by employees of tertiary educational institutions in Kano state. Survey research design was adopted and four tertiary educational institutions in the state were selected. A questionnaire, administered on a sample of 250 respondents, was the only research instrument employed for data collection. Data analysis was accomplished by using descriptive statistical techniques and the analysis was facilitated by the use of Ms-Excel package. It was thus revealed that employees in tertiary educational institutions in Kano state do not only have high level of awareness of ICT benefits but have in fact adopted the use of ICT facilities. Though they have high level of ICT adoption their ICT literacy level was found to be just moderate. It was recommended that ICT skill acquisition level of staff members in tertiary educational institutions should be enhanced by their employers through regular attendance of relevant workshops, seminars and conferences.

Introduction

During the 1980s, Information and Communication Technology (ICT) became increasingly important to the development and execution of corporate and marketing strategies, and ICT was increasingly applied in the search for competitive advantage (Porter, 1980). Recent developments in the field of Information and Communication Technology (ICT) have led commentators to announce the arrival of a third age of computing in which the computer themselves are being overshadowed by the communications capabilities they provide

individuals and organizations. Therefore, every individual who wants to excel in his/her chosen career must embrace this reality, as 'information is power' and whoever has access to it gets power. In educational institutions, the importance of computer as a medium for providing information to researchers and scholars is obvious. In this study, the term "Information and Communication Technology" (ICT) and "Information Technology" are taken to mean the same and would therefore be used synonymously. Educational institutions are 'information dissemination and exchange centres' and the crucial role of IT in this direction has come to stay with all members of these institutions. Interestingly and more recently, the availability of e-mail and Internet facilities in academic institutions offers a wide range of access to information globally without geographical barrier. For instance, academicians and other library users in Nigeria now send e-mail or browse websites on the Internet (Omoniwa, 2001). Through IT, every member of educational institution now has unlimited access to all facets of information, but knowledge places limit on one's access to information and information is knowledge! Then, if Information Technology (IT) is sine qua non to the existence educational institutions, skill acquisition on how to use IT (i.e. IT adoption) by organizational members is of no little significance.

Few studies have been earned out to investigate the state of IT in Africa, Nigeria in particular. Alemna, Chifwepa and Rosenberg (2000) explored the ICT availability in the University of Ghana's library and the University of Zambia's library and reported the availability

of CD-ROM, e-mail and Internet services at both libraries. Omoniwa (2001) traced the attempt to computerize Kashim Ibrahim Library at ABU from 1972 to 2001 and discussed the problems that had militated against the computerization effort. Oketunji, Daniel, Okojie and Abdulsalam (2002) in their study were concerned with determining the state and future of ICT in libraries and information services in Nigeria. In Nigeria, the evolution, development and advances in modern IT have brought in a dramatic and an unprecedented revolution in information management and services, especially as it affects teaching and research activities in tertiary educational institutions. It is in recognition of this that tertiary educational institutions in Nigeria have begun to develop IT and information system strategies to deal with the need to respond to rapid changes in information technology which affect content of nearly every course curriculum. The rate and extent of IT adoption by staff members of tertiary educational institutions in Nigeria and Kano state in particular has not been empirically established and this is the gap that this study would fill.

Literature Review

Martin, Brown, DeHayes, Hoffer and Perkins (1999:24) Define Information Technology as:

a term that encompasses all forms of technology utilized to create, capture, manipulate, communicate, exchange, present and use information in its various forms (business data, voice conversations, still images, motion pictures, multimedia presentations, and other forms, including those not yet conceived).

From a more pragmatic and technological perspective, IT is related to all technologies used to collect, store, process graphically display and transport data, and therefore encompasses computer equipment and system programs, application programs and

communication facilities.

Acquiring or adopting a technology is not sufficient. In order to obtain the anticipated benefits, the technology must be deployed and applied appropriately by the organization and its intended users. IT innovation adoption process as Damanpour (1991) explains, can only be considered a success to the extent that innovation is accepted and integrated into the organization, and the target individual adopters demonstrate commitment by continuing to use the technology over a period of time (Bhattacharjee, 1998). Thus, the full and actual adoption' of IT in an organization's context implies that adoption also occurs both within the organization and at the individual adopter level. The IT adoption decision process leading to institutionalization of usage may, as Rogers (1995) posits, be conceptualized as a temporal sequence of steps through which an individual organization passes from initial knowledge of an innovation, to forming a favourable or unfavourable attitude towards it, to a decision to adopt or reject it, to putting the innovation to use, and to finally seeking reinforcement of the adoption decision made. Unlike the individual adoption process comprising five stages, eight stages of organizational IT adoption process are identified namely, motivation towards innovation; specific conception about innovation; a formal proposal; actual adoption; implementation; confirmation of innovation idea; user acceptance of the technology and integrating the technology with information systems (Davis, 1989; Agarwal and Prasad, 1998 and Dixton, 1999). The first four (4) stages are known as pre-adoption stages and the other stages that follow the actual adoption stage are called post-adoption stages. The post-adoption stages are the stages where the target behaviour is continuous usage of the IT innovation.

We are in the information age; a time when knowledge is power and knowledge workers outnumber all other workers by a 4 to 1

margin. A knowledge worker works with and produces information as a product and the potent weapon is technology (Dixton, 1999). Among the factors shaping business world today are information, virtual workplace and telecommuting, electronic commerce - all of which depends on technology. The era of virtual workplace has come to stay with us, we all work in a technology-based workplace - no walls or boundaries, anytime, anyplace, linked to other people and information. It must be stressed that we are now in technology knowledge and to participate in this knowledge, one must learn how to use technology, and information technology is now a collapser of time and space (Ryssel, Thomas and Gemunden, 2004)

Purpose and Scope of the Study

This study was guided by the following objectives: (i) to determine the respondents' level of awareness of IT and (ii) to assess the respondents' IT literacy level.

This study was focused on four selected tertiary educational institutions in Kano state: Bayero University, Kano; Kano State Polytechnic; Federal College of Education, Kano and Kano University of Science and Technology. Institutional members were taken to be staff members only. Therefore, student members are outside the scope of this study. Specifically, consideration of IT skill acquisition by members of tertiary educational institutions was taken to be computer (PC and laptop) used for data/word processing and Internet related resources (services).

To achieve the purpose of the study, the following research questions were raised to provide further guide:

- (i) Are staff members of tertiary educational institutions aware of the benefits of acquiring Information Technology (IT) skills?
- (ii) To what extent are members of tertiary educational institutions IT literate?

- (iii) What approaches do they employ in order to become IT literate?

Methodology

Descriptive survey designed was adopted for the study and population of the study consisted of all staff members in the four selected tertiary educational institutions in the state. A sample size of two hundred and fifty (250) was selected for the study. This sample size was proportionally distributed as follows:

Table 1: Distribution of selected sample by the educational institutions

Educational institution	Sample selected
Bayero University, Kano (BUK)	100
Federal College of Education, (FCE) Kano	50
Kano State Polytechnic	50
Kano University of Science and Technology (KUST)	50
<i>Total</i>	250

In each of these schools, random sampling technique was adopted to select those staff that made up the sample size. A structured questionnaire served as the main data collection instrument. The instrument was administered with the aid of research assistant in each of these schools. Three experts in educational programme evaluation in BUK and FCE Kano determined the content validity. The reliability was determined through a test-re-test method. A small sample size of 15 staff from Federal College of Education, Kano was used in the test and a reliability coefficient of 0.75 was obtained. Descriptive statistical technique was employed to present data analysis and the analysis was accomplished with the aid of Ms-Excel package.

Data Presentation and Discussion

Although a total of 250 copies of the questionnaire were distributed, only 210 copies were eventually retrieved and all were found usable for data analysis

A key issue in this study was ascertaining the respondents' level of awareness of the benefits of IT. Hence, they were asked to indicate their level of awareness of each one of 16 listed benefits of IT. The summary of their responses was presented in table 2.

Table 2: Awareness of the Benefits of it by Staff Members

IT Benefits Sample mean	Sample S.D	Z-score
Managing students/ staff records/files	3,662 1.169	3.313
Student registration	3.587 1.203	
Processing of exams results	1.194	2,662
3.754		
Processing of office documents	1.111	4.031
Inventory management	1,192	0.328
3.321 Dissemination of information	1.163	4.525
Processing staff payroll		0.755
3.369 Composition of music	1.422	
2.725	1.375	-4.878
Managing accounts receivable/payable	1,364	
3.059 Searching for research materials	1.057	-1.961 5.938
Sending /receiving e-messages	1.117	6.253
3.997 Simulation of experiments	1.290	-3.644
2.867 Generation of product prototype	1.235	-5.058
2.705 Instructional device (tutor)	1.267	-1.265
3.138 Health management	1.408	-6.741
2.513 As a robot in factory	1.366	-8.379

Population mean

3,283

0.114

Population std. Deviation

n=210

Analysis revealed high level of awareness (in decreasing order) of the use of it in: 'sending/receiving e-messages' (z-score = 6.253), 'searching for research materials'¹ (z-score - 5.938), 'dissemination of information' (4.525), 'processing of exams results' (4.121), 'processing of office documents' (4.031), 'managing students/staff records'- (3.313) and 'students registration' (2.662), processing staff payroll (z-score = 0.755) and inventory management (z-score = 0.328). Similarly, there was a relatively low level of awareness of the use -of it in: 'instructional delivery' (-1.265), 'managing accounts receivable/payable' (-1.961), 'simulating experiments' (-3.644), 'composing music' (-4.878), 'generation of product^ prototype' (-5.058), 'health management' (--6.741) and 'as a robot in factory' (-8.379). It could be seen from the above presentation that, respondents are very much aware of the power of computer in communication arena. Also, staff members are not ignorant of the place of it in research and documentation.

Further analysis revealed that majority of the respondents (100 or 47.62%) have high level of awareness of it benefits; 75 or 35.71% have moderate level of awareness while only 35 respondents (16.67%) have low level of awareness of it benefits.

An attempt was made to ascertain the means through which the respondents got to know of it. it was shown that majority of the respondents (57 or 27%) got to know of it while on the job; 23.81% while in school, 14.77% through computer institute, 12.39% through professional colleagues, 8.60% through friends, 5.72% through computer analyst, 4.80% through relatives while only 2.88% got to know of computer through neighbours. thus, majority of

the respondents were aware of it essentially while on the job or through educational institutions (i.e. formal education), and to a rather less extent through computer training institute.

It was also considered pertinent to ascertain the it literacy level of the respondents. Hence, they were asked to indicate the extent of their ability to use computer to perform each one of the listed 17 functions/activities. The summary of their responses was presented in table 3.

Table 3: of Respondents' IT literacy Extent level

IT Usage	Sample mean	Sample S.D	Z-score
Word processing	3.8100	1.1225	10.5543
Data processing	3.4881	1.646	6.4312
Typesetting of textbooks	2.9103	1.3598	-0.9701
Statistical analysis	2.8575	1.2369	-1.6461
Instructional presentation	2.9261	1.2556	-0.7674
Graphic design	2.5303	1.2955	-5.8368
Architectural drawings	2.1478	1.3311	-10.7372
Playing games/entertainment "	- - - - -		
Managing students/ staff records	3.1821	1,3158	2.5108
Registration of students	3.0528	1.4057	0.8548
Processing of exams results	3.1135	1.3571	1.6321
Dissemination of information	3.3747	1.3101	4.9779
Processing of staff	2.4142	1.4216	-7.3238
Payroll Composition	2.2058	1.3549	-9.9937
of music			
Searching for research materials	3.6253	1.3302	8.1886
Sending /receiving e-messages	3.7599	1.2442	9.9122
Simulation of Experiments	2.2797	1.2852	-0.0474

Population mean
2.9860 **Population std.** **0.0781**
Deviation

n = 210

Analysis revealed that there was good knowledge-in the use of computer to perform word processing (z-score = 10.5543), to send/receive e-messages (9.9122), to search for research materials (8.1886), to perform data processing (6.4312) and to disseminate information (4.9779). This is consistent with the findings of Omoniwa (2001) that academicians and other library users in Nigeria now send e-mail or browse websites on the Internet. On the other hand, the respondents have relatively no knowledge in using computer to generate architectural drawings (z-score = -10.7372), compose music (-9.9937), process staff payroll (-7.3238) and graphic design (-5.8386). On the whole, the respondents could use computer to perform 9 out of 17 tasks. Adoption is a function of awareness and persuasion, hence this finding is consistent with the previous discovery that employees have high level of awareness of computer as a tool for sending/receiving e-messages. Thus, this informed their high level of literacy in using computer for this purpose.

Further analysis showed that about 28% of the respondents have relatively low level of IT literacy, 42.60% have moderate level while 29.40% have a relatively high level of IT literacy.

Analysis of the approaches/procedures adopted by the respondents in becoming IT literate was also carried out. The summary of the results was presented in table 4. The results showed that IT literacy was acquired through: 'self-effort' (z-score = 6.2440) and 'courses taught in formal educational institutions' (1.5620). Little or no knowledge was gained from: attending 'IT literacy programme' (-4.4608), 'computer appreciation workshop' (-2.3625) and 'computer training school' (-0.9831).

Table 4: Approaches Adopted in becoming IT Literate

Approaches Z-score	Sample		Sample Z-score
	mean	S.D	
Self-efforts (informal Training)	4.0487	1.1132	6.2440
Courses taught in Formal education institution	3.4308	1.2457	1.5620
Attending computer Training school	3.0949	1.4812	-0.9831
Attendance of computer Appreciation workshop	2.9128	1.2917	-2.3625
Attendance of IT Literacy programme	2.6359	1.2929	-4.4608
Population mean and std. Deviation	3.2246	0.1320	

n=210

Conclusion

Employees of tertiary educational institutions in Kano state have high level of awareness of IT benefits and got to know of CIT while on the job and/or in school. Staff of tertiary educational institutions have moderate level of IT literacy with good capability in using computer for word processing, sending/receiving e-messages, sourcing research materials and disseminating information. Interestingly, staff members are unable to use computer to generate architectural drawings, compose music and process staff payroll. The employees gained knowledge of computer through self-effort and/or courses taught in formal educational institutions.

Recommendations

Employees should be encouraged to have access to expertise in data processing, graphics and publishing packages. Sponsorship to attend workshops and seminars in specialized software should be provided for staff members in order to broaden their knowledge for greater expertise,

There is still much need to raise the employees' level of awareness of computer as a device for instructional materials delivery. Academic staff members should be encouraged to engage IT facilities in their teaching and research assignments through constant training and retraining. Provision should be made for demonstrations of working examples to showcase innovative applications of IT especially in teaching and learning.

Institutional culture which values and rewards IT innovation should be embraced by school administrators. This would serve as encouragement to innovators and a challenge to 'laggards'.

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