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Computer Anxiety as Predictor of Librarians' Perceived Ease of Use of Automated Library Systems in Nigerian University Libraries

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Abstract

The paper examines the predictive effect of computer anxiety on perceived ease of use of automated library systems by library staff in Nigerian universities. A survey research design was used to collect data on level of computer anxiety and perceptions of ease of use of automated library systems among the library staff. The study found that many of the university libraries in Nigeria are not yet fully automated,due to financial constraints, erratic power supply and inadequate information technology (IT) facilities. The study also found that the main library routine for which the computer is used to perform is cataloguing. The library staff exhibited a moderate level of computer use anxiety; yet,computer use anxiety was found to be a strong predictor of perceived ease of use of automated library systems by the library staff. The paper recommends adequate funding of university libraries to facilitate the financing of continuing IT use training programmes for library staff, which would, in turn, enhance optimal use of automated library systems in the university libraries.

Keywords

University libraries, library automation, computer anxiety, Nigeria.

Introduction

In this age of globalization, the importance of information technologies cannot be over-emphasized. The university library occupies a significant position in every university. This is so because a good university library is one that effectively helps in galvanizing the university's human intellectual capacity by providing adequate and timely information in support of the teaching, learning and research activities of the university. Several library routines, therefore, need to be performed by librarians, in order for the library to be an effective information centre. Rowley (1998) identified the basic functions that might be expected in any library management system as ordering and acquisition, cataloguing, circulation control, serials control, management information, inter-library loans, community information, and Internet access.

The needs of library clienteles in the digital age are such that they cannot be met adequately with the use of the manual systems. This is because of drawbacks associated with manual systems such as delays, errors, as well as the physical and mental efforts required of library staff and users by such systems. While supporting this view, Akinyokun (2000) stated that the manual system of carrying out library tasks involves a considerable amount of paper work, and does not promote the effective and efficient performance of the librarians. This underscores the importance of automation in modern libraries.

Smith (1997), however, stipulated that the success or failure of an information technology (IT) IT application, such as an online public access catalogue (OPAC) system, often depends upon acceptance by the user. The IBM Dictionary of Computing (1993) defined usability as "the ability of a system, programme or device that enables it to be easily understood and conveniently applied by the user." Hackbarth, Grovers and Yi (2002) argued that IT users are likely not going to adopt or use a system if they perceive it to be difficult to use. Perceived ease of use cannot be separated from the quality of an IT application. In other words, it serves as a measure of IT quality and usability. If an automated library system is perceived by library staff as difficult to use, there is the tendency for them to detest using it, and vice versa. IT quality and usability are, therefore, variables likely to influence library staff's perception about the ease of use of an automated library system. In this connection, Szajna (1996) recalls the Technology Acceptance Model's prediction that external variables will definitely influence technology adoption indirectly via perceived ease of use and perceived usefulness.

Statement of the Problem

Most university libraries in Nigeria are either automated or in the process of doing so. This reflects the recognition by the universities of the importance of automated universities to their missions. However, the actual effective operational use of automated library systems in the libraries is a variable that also needs to be continually investigated within individual university libraries. It is one thing for a library to be automated, and another for the automated library system to be put to optimal use. If an automated library system is complex to use, satisfaction may not be derived by library staff from its use. As a result, they may avoid using it, which means that the objectives of system would not be achieved. The study therefore was conceived and designed to investigate the predictive effect of computer anxiety on perceived ease of use of automated library systems by library staff in Nigerian universities.

Objectives of the Study

The main objective of the study was to investigate the relationship between computer anxiety as a potential determinant of library staff's perception of the ease of use of automated library systems in Nigerian universities. The specific objectives are:

(a) To identify the library operations/routines, which the library staff perform with computers.
(b) To ascertain the library staff's level of anxiety about computer use.
(c) To determine the predictive effect of computer anxiety on perceived ease of use of automated library systems by library staff.
(d) To find out if computer anxiety and perceived ease of use vary by the level of automation of the university libraries.

These objectives generated the following research questions and hypotheses for the study:

Research questions

(a) What are the library operations/routines, which the library staff perform with computers?
(b) What is the level of anxiety about computer use among library staff?

Research hypotheses

(1) There is no significant relationship between computer anxiety and perceived ease of use of automated library systems by library staff.
(2) Perceived ease of use of automated library systems by library staff does not depend significantly on the combination of library staff's level of computer anxiety and the level of university library automation.

Literature Review

Literature and empirical work relevant to this study pertains to the variable 'computer anxiety', including its alternative definitions, its causes, as well as the effects of computer anxiety on use of information systems generally. The term 'anxiety' has been defined differently by different writers. For instance, French (1997) defined it as a state of emotional and physical disturbance induced in a person by a real or imagined threat. Anxiety may arise in a specific situation that the person seeks to avoid. Such a state is called phobia. Andreasen (2000), on the other hand, believes that anxiety is a term used by mental health professionals to mean the same as fear or worry.

This writer illustrates the phenomenon thus: when people dread or avoid particular objects or activities, such as spiders, flying or being in high places, these special dreads are called phobias.

Bozionelos (2001) defined computer anxiety as the "negative emotions and cognitions evoked in actual or imaginary interaction with computer-based technology." In a similar vein, computer anxiety is regarded as a situation whereby a person fears computer when using it or is afraid of the possibility of using it (Chua, Chen & Wong 1999). This definition implies that computer anxiety has to do with a person's emotional reaction towards using computers. This is unlike a negative attitude toward computers, which entails beliefs and feelings about computers (Heinssen, Glass & Knight, 1987). Rosen and Weil (1987), quoted by Deloughry (1993), further differentiated among the following terms:

Anxious technophobe: Exhibits the classic signs of an anxiety reaction when using technology: sweaty palms, heart palpitations and headaches.

Cognitive technophobe: On the surface is calm and relaxed, but internally seethes with negative messages such as "everybody but me knows how to do this" or "I'll hit the wrong button and mess this machine up!"

Uncomfortable user: May be slightly anxious or use some negative statements, but generally not in need of one-on-one counselling.

Some reasons have been advanced by writers on the cause of computer anxiety. For instance, Ganzel (1998) was of the view that several computer users feel anxious when they deal with computer system, especially at the initial stage of interaction. However, the users' initial anxious feelings will be overcome, replaced with favourable perceptions as they familiarize themselves with the system interface and functionality. There is no doubt that the bottom line of Ganzel's view is experience. On the issue of experience, Necessary and Parish (1996) stated that students with little or no computer experience have more computer anxiety, compared with their counterparts who have computer experience. The likely implication of this is that reduced computer anxiety further increases computer usage, thus enhancing a user's positive attitude to computer use.

In a related development, Gos (1996) revealed that prior computer experience correlates with current computer anxiety. This may imply that the students with unpleasant prior computer experience tend to be computer phobes unlike their counterparts who do not, because they have pleasant prior computer experience. While the former shows negative attitude towards computer use, the latter shows positive attitude. Also, in a study conducted in the United States of America, Rosen and Weil (1995) reported that, out of the 488 teachers that were surveyed in elementary and secondary schools, between one-third and two-thirds of them were not using computers, due to their lack of confidence or felt frightened by computers. While corroborating this view, Russell and Brandley (1997) stated that "teachers' lack of confidence in their ability to use computers effectively in classrooms can be understood as a form of computer anxiety or cyber phobia."

At this juncture, the issue of the likely effects of anxiety on IT use comes to mind. Anderson (1996) documented that computer anxiety has been shown to affect students approach to the use of computers while embarking on their studies. The implication of this may be a show of negative disposition to IT use. Supporting this notion, Doyle, Stamouli and Huggard (2005) opined that "individuals who suffer from computer anxiety usually display negative behaviour and physiological reactions to computer." Some instances of the negative behaviour have been pointed out by scholars thus: avoidance of use of computers (Anderson, 1996), minimizing the use of computers with extra care (Beckers & Schmidt 2001).

In the area of physiological reactions to computer use, Beckers and Schmidt (2001) identified issues like dizziness, sweaty palms and shortness of breath. It is obvious therefore that the identified negative behaviour and psychological reactions may lead to people's perception that the computer is difficult to use. For instance, Rosen and Weil's (1995) study showed that teachers in elementary and secondary schools in the United States of America actively avoided the use of computers whenever the gadgets were available. Furthermore, on the effect of computer anxiety on its use by people, it has been observed that when educators become computer anxious, it is seen as a stumbling block to integrating computers into educational programmes (Rezoich, 1996, Yang, 1996, Gunter, Gunter and Wiens, 1998).

To wrap up the effect of computer anxiety on computer use, Harrington, McElroy and Morrow (1990) discovered that a high level of computer anxiety has been found to be negatively related to learning computer skills, resistance to the use of computers (Torkzadeh and Angula, 1992; Weil & Rosen, 1995), and poorer task performance (Heinssen, et al., 1987).

Methodology

This study is a survey that employed a survey approach to data collection. The survey population comprised the 581 library staff in the 17 Nigerian federal and state government-owned university libraries that had automated or were automating their operations. The university libraries were categorized into three levels in terms of the level of computerization attained – initial, partial, and high. The *initial* level of computerization was defined as including the processes of planning for computerization, acquisition of hardware and software, and the use of the computer only for word processing and desktop publishing functions in the libraries. The *partial* level was defined to involve the use of the computer for performing a few library routines, but excluding the total retrospective conversion of manual catalogue records into a library catalogue. It is also characterized by the absence of Online Public Access Catalogue (OPAC). Finally, the *high* level was defined to involve the use of computer for virtually all library routines and services. This level is characterized by complete automated networking of the library.

Library staff surveyed in the study included all those that used computer in their jobs or functions in the library. They consisted of university librarians, other librarians, library officers as well as systems staff and secretaries. The population figures were obtained through personal contacts by the researcher during preliminary investigations. The university libraries were purposively sampled to ensure that one library was selected from the populations of libraries that had achieved initial, partial or high level of computerization at the time of the study. An initial pilot study of the university libraries provided information about the level of computerization in the population of university libraries and the total population of library staff as defined. Proportionate purposive sampling was used to select about two-thirds of the library staff in each library for the study, yielding a total sample of 386 respondents (Table 1). The table also shows how the 386 respondents were distributed in terms of the different staff categories in the university libraries. A breakdown of the sample shows that there were 17 university librarians, 194 other librarians, 113 library officers, and 62 systems staff and secretaries.

Table 1: Catergories of Library Staff Sampled from each University Library

S/N	University Libraries	Library Computerization Level	Total Library Staff	Categories of Staff Sampled				Total Sample	Sampling Rate %
				Univ. Librarians	Other Librarians	Library Officers	Systems Staff and Secretaries		
1.	Univ. of Ibadan Library, Ibadan	Partial	46	1	17	7	6	31	67.3
2.	Univ. of Nigeria Library, Nsukka	Partial	35	1	11	7	4	23	65.7
3.	Univ. of Lagos Library, Lagos	Partial	45	1	17	8	4	30	66.7
4.	Ahmadu Bello Univ. Library Zaria	Total	45	1	14	9	6	30	66.7
5.	Univ. of Benin Library, Benin City	Partial	40	1	15	6	4	26	65.0
6.	Obafemi Awolowo Univ. Library, Ife	Partial	34	1	13	6	3	23	67.6
7.	Abubakar Tafawa Belewa Univ. Library, Bauchi	Partial	33	1	11	7	3	22	66.7
8.	Univ. of Jos Library, Jos	Total	35	1	12	6	4	23	65.7
9.	Univ. of Calabar Library, Calabar	Initial	30	1	9	7	3	20	66.7
10.	Univ. of Maiduguri Library, Maiduguri	Partial	25	1	8	5	3	17	68.0
11.	Univ. of Ilorin Library, Ilorin	Partial	35	1	13	6	3	23	65.7
12.	Bayero Univ. Library, Kano	Partial	32	1	10	7	3	21	65.6
13.	Federal Univ. of Technology, Library Owerri	Partial	31	1	9	7	4	21	67.7
14.	Federal Univ. of Technology Library, Akure	Partial	30	1	11	5	3	20	66.7
15.	Univ. of Agriculture Library, Abeokuta	Partial	30	1	9	7	3	20	66.7
16.	Delta State Univ. Library, Abraka	Initial	35	1	11	8	3	23	65.7
17.	Michael Okpara Univ. Library, Umudike	Initial	20	1	4	5	3	13	65.0
	Total		**581**	**17**	**194**	**113**	**62**	**386**	**66.4%**

Key:
Initial level – Use of computer mainly for word – processing and desktop publishing in the library;
Partial level – Use of Computer to perform few library routines, but excluding OPAC;
High level – Use of computer to perform virtually all library routines/operations and networking.

Results and Findings

During the preliminary field survey of the selected universities, the study found that computer systems were being used to perform one or more of the following library operations or routines: acquisitions, cataloguing, circulation, serials, reference services, word processing, library statistics, inter-library loan, library management, Internet access, OPAC, Online searches, CD-ROM searches, etc. Table 2 summarizes the frequencies with which computer systems were being used to perform the different library operations/routines.

The majority of the respondents (194, representing 77.0%) used computers to perform cataloguing routines. This was followed by Internet access - 162 (64.3%) respondents, OPAC/Online searches 157 (62.3%), word processing 150 (59.5%).

The main routines indicated in the 'Others' category were e-mailing and e-classroom participation. The majority of the respondents who indicated Internet and online search routines were equally the ones who stated that they used computer for e-mailing and e-classroom participation.

The above results on the relative uses of computer for different library operations are different from the finding of Idowu (1997) that "word processing is the commonest usage to which the librarians applied that computers …" It is important to note, however, that although the majority of the university libraries used the computer to perform cataloguing routines, it does not mean that the routines are effectively performed over the years. This is because the libraries often face impediments to their use of computers to perform cataloguing routines. For instance, Ajibero (2001) lamented that, "one of the major problems in designing and implementing computerized cataloguing system is the issue of retrospective conversion." The researcher observed in the course of this study that the problem of retrospective conversion of existing library records to computerized format still lingers in many automated university library systems in Nigeria.

Table 2: Library Operations/Routines Performed with Computer Systems

Types of Library Operations/Routines	Frequency	%
Cataloguing routines	194	77.0
Internet access	162	64.3
Online public access catalogue (OPAC)	157	62.3
Online searches	157	62.3
Words processing	150	59.5
Acquisition routines	113	44.8
Serials routines	107	42.5
Circulation routines	105	41.7
Library statistics	103	40.9
Reference routines	93	36.9
CD-ROM searches	74	29.4
Library management routines	67	26.6
Inter-library loan routines	22	8.7
Others	16	6.4
Total respondents = 252		

Level of Anxiety about Computer Use

This issue was dealt with under the second research question. The results of the analysis are presented in Table 3.

Table 3: Respondents' Level of Anxiety about Computer Use

	Responses			Total
Library Staff category	**High**	**Moderate**	**Low**	
University Librarians	1	5	2	8
Dep. Univ. Librarians	1	6	2	9
Principal Librarians	3	14	5	22
Senior Librarians	4	15	7	26
Librarians I	5	20	8	33
Librarians II	2	10	3	15
Assistant Librarians	4	15	10	29
Library Officers	16	26	14	56
Systems Staff/ Secretaries	15	27	12	54
Total	**51**	**138**	**63**	**252**

The data in Table 3 indicate that the level of computer use anxiety varies with category of staff. However, the majority of the respondents, i.e. 138 (54.8%) indicated a moderate level of anxiety about computer use. This means that many library staff are still not completely free from the negative emotions and cognitive stress involved in their actual or envisioned interaction with the computer to perform library and other tasks. Such fear is also likely to affect negatively their perceptions about the ease of use of automated library systems and, hence, their job performance. Previous studies by Russell and Bradley (1997) and Harrington, McElroy and Morrow (1990) supported this finding.

Relationship between Computer Anxiety and Perceived Ease of Use of Automated Library Systems

This section reports the results of the tests of the two hypotheses of the study. The potential predictive effect of computer anxiety on perceived ease of use

of automated library systems is the purpose of research hypothesis 1, which states: "There is no significant relationship between computer anxiety and perceived ease of use of automated library systems by library staff." Toward performing analyses to validate this hypothesis, the computer anxiety level of the sampled university library staff was correlated with their corresponding perceived ease of use of automated library systems, using the Pearson correlation method. Table 5 reports the results.

Table 4 shows that the mean score of perceived ease of use of automated library systems by library staff in Nigerian universities is (x = 62.41, SD = 9.70) while the mean score of their computer anxiety is (x = 31.86. SD = 11.78). The results also show that there is a significant negative relationship between computer anxiety of the staff in Nigerian university library and their perceived ease of use of automated library systems (r = -0.346, p<.01). Therefore, the null hypothesis was rejected. In other words, the library staff who are computer anxious are more likely to perceive the use of automated library systems as difficult. This finding agrees with the observation by Doyle, Stamouli and Huggard (2005) that "people that suffer from computer anxiety are fond of displaying negative behaviour, as well as physiological reactions to computers. Other studies by Yang (1996), Gunter, Gunter and Wiens (1998), Torkzadeh and Angula (1992), Weil and Rosen (1995) and Rezoich (1996) attested to this relationship between computer anxiety and usage of information systems by people.

Table 4: Mean and Standard Deviation and Correlation of Computer

(a) Means and standard deviation			
Variables	*Mean*	*Std. Deviation*	*N*
Perceived ease of use of automated library systems	62.4048	9.70126	252
Computer anxiety	31.8611	11.77717	252

(b) Correlation coefficient	
	Level of Computer Anxiety
Perceived Ease of Use of Automated Library Systems	-346**
** Pearson correlation was significant at the .01 level (2-tailed). N=252.	

The second hypothesis states: "perceived ease of use of automated library systems does not vary significantly on the basis of library staff's level of computer anxiety and level of university library automation." In testing this hypothesis, two-way analysis of variance with more than one entry per cell was employed. The results are shown in Table 6.

Table 5 shows a significant relationship between perceived ease of use of automated library systems by library staff and their level of computer about computer use (categorized for the analysis as high, moderate and low). On the other hand, there was no significant relationship between perceived ease of use of automated library systems by the library staff and the level of automation achieved at the university libraries where they worked (categorized as high, partial and initial). Finally, there was no significant interaction effect of the level of computer anxiety and level of automation achieved on perceived ease of use of the automated library systems.

Table 5: ANOVA Results of the Effect of Computer Anxiety and Level of University Library Automation on Perceived Ease of Use of Automated Library Systems

Source of variation	**Sums of Squares**	**Df**	**Mean Square (MS)**	**F**	**Remark**
Library Automation Level	10.85	2	5.42	0.18	Not Significant
Computer Anxiety Level	55126.79	2	27563.40	898.29	Significant
Interaction (Automation x Anxiety)	47.09	4	11.77	0.38	Not Significant
Within Cells	7456.32	243	30.68		
Total	62641.05				

Conclusion and Recommendations

This study has established that the majority of the university libraries in Nigeria were yet to be adequately computerized, not to talk of being fully automated. The study found that the major library routine to which the computer was being applied in Nigerian university libraries at the time of the study is cataloguing. This represents some evolutionary growth from the status about a decade earlier, when Idowu (1997) reported that computers in Nigerian university libraries were being used mostly for word processing applications.

This study found a moderate level of computer anxiety among the library staff, and that the moderate level of computer anxiety nevertheless still correlated inversely significantly with perceptions by the library staff of the ease of use of the computerized library systems. What this means is that the library staff are likely to consider their automated systems difficult to use, partly because they exhibit some anxiety about the use of computers and, by extension, the automated library systems in their libraries.

Arising from both the findings of this study, as well as the factors identified by earlier researchers to be responsible for the slow pace of automation in Nigerian university libraries, this study proffers the following recommendation to improve the situation in Nigerian university libraries:

- Training programmes like seminars, workshops, etc, on IT use should be organized periodically by university libraries for their staff. This will enable library staff to update their knowledge about emerging new information technologies being introduced in the libraries, thereby reducing their level of computer anxiety.
- University libraries should strategize to improve their access to funds from government, their parent universities and other sources towards meeting the financial and technical demands of effective and efficient library automation, such a reliable electricity supply, networking, Internet connectivity and staff training.

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