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An exploratory study of the critical factors affecting the acceptability of e-learning in Nigerian universities

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Abstract

Purpose – Education delivery via electronic media is becoming relevant in Nigeria educational systems, especially the universities. In spite of this, there are hindrances affecting the total acceptability of this technology.

Design/methodology/approach – In this paper, we investigated these critical factors by analyzing the questionnaires collected from three sampled universities in Nigeria: private, public and state owned universities.

Findings – The results obtained indicated that mass unawareness, low computer literacy level and cost were identified as the critical factors affecting the acceptability of the technology.

Originality/value – Analysis herein has shown the factors affecting the acceptability of e-learning in Nigeria. The results obtained will assist policy makers by finding solutions to literacy problems in Nigeria.

Keywords Critical success factors, E-learning, Factor analysis, Nigeria

Paper type Research paper

1. Introduction

The provision of qualitative and quantitative education to aspiring university students, undergraduates, graduate students and the like in Nigeria is a major responsibility of Nigerian universities, and their success or failure at this task is largely dependent on their capacity to respond rapidly to the opportunities that exist for education delivery in today's fast changing and technology-driven world.

It is no new information that the advances in communication and computer technologies have culminated in the supplementation and near phase-out of traditional educational delivery media such as chalk-boards and overhead projectors with newer technology-based media which allow for more flexibility in learning and a wider reach for education in many countries worldwide. In recent times, the issue of mobile learning, which means the use of wireless electronic technology to deliver and receive knowledge and skill, has been raised and is practiced in the developed nations of the world. Nigerian universities, however, can be said to be behind in the adoption of these technologies as there is evidently an extremely low rate of diffusion of e-learning and as a consequence a



low rate of usage. The reason for this are not farfetched, as Nigeria, apart from being a developing country and having an inadequate education finance policy, is also highly deficient in the area of engineering and technological development. These problems have had their toll on university education in the country, serving as obstacles to improvements in knowledge delivery, research and other facets of university education.

By way of orientation, this paper first presents a brief introduction of the object of study after which the major factors affecting the acceptance of e-learning in Nigerian universities as identified by respondents were analyzed one after the other, after briefly looking at prior related research. Next, outlines of the research design and method used in analysis are made. After this comes the analysis of the results which is further clarified in the discussion area. Lastly, a conclusive review of the study incorporating its contributions to knowledge is made.

2. Literature review

Prior research on e-learning has been geared towards the study of factors that influence the efficiency of e-learning in different sectors. According to Andreu and Jauregui (2005), there has also been research into whether traditional training is better than the use of technology or vice versa. Another aspect of research that has received considerable attention has been the use of the technology acceptance model TAM to identify and relate factors affecting the acceptance of e-learning in various sectors.

This research has suggested that e-learning's acceptability is a function of the factors outlined below.

2.1 Low awareness level

Awareness in an information systems context means the knowledge of the existence and importance of a computer based technology. Awareness in this research has been divided into three parts:

- (1) Connotes the of level business or organizational receptiveness to certificates or results obtained through e-learning. This also incorporates the measurement of factors such as management's receptivity to e-learning and perceived efficiency of e-learning by labor employers.
- (2) This looks at the level of knowledge of e-learning possessed by students in Nigerian universities. It considers the amount of students that know, however superficially, or have used e-learning.
- (3) We use this to measure the rate of diffusion of the technology in Nigerian universities.

2.2 Low computer literacy level

The computer literacy level seeks to measure the degree of proficiency of university students in basic computer oriented operations. This was measured using questions that seek out ability to use basic computer application packages such as Microsoft Word, and graphic and spreadsheet packages.

2.3 Vendor issues

Vendor issues considers the efficiency of the communication links, the platform providers, software and the hardware that are available for e-learning in Nigerian universities. The irregularities of internet service providers and the availability of cheap, low quality software was also considered.

2.4 High cost of implementation

The cost of executing capital-intensive projects, such as establishing e-learning centers in Nigerian universities, is something to think twice about, as there are many needs; some recurrent, others competing for capital, for the insufficient finance available to university management.

Cost as used in this research includes the cost of the necessary hardware resources, cost of retaining specialized information technology or systems staff, cost of ensuring uninterrupted power supply considering the epileptic power supply in the country, software costs and other strategic costs.

In theory, it is believed that the majority of factors working against e-learning in Nigeria are associated with cost.

2.5 Students' resistance

Students' resistance studies the degree of negative attitude and rejection shown by Nigerian university students to e-learning (Brennan, 1991). The general belief in these parts is that the average Nigerian student is highly receptive to new ideas and innovations.

3. Methodology

The review of prior literature on this subject shows that very few empirical studies that identify and rank the critical factors affecting the acceptance of e-learning have been conducted. The sources of data for this research were: documents, journals, questionnaires and books, with questionnaires being the most important. The others were used to provide affirmation and crosschecking of data and results.

Questionnaires, mainly composed of questions structured to a five-point Likert scale, where 1 = strongly disagree and 5 = strongly agree, was administered to 1,600 staff and students of three Nigerian universities: Olabisi Onabanjo University Ago-Iwoye Ogun state – a state owned university; Babcock University – a private university; and the University of Agriculture Abeokuta Ogun state – a public university.

Out of the 1,600 questionnaires sent to these schools via computer science lecturers and administered to students to fill in as proof of attendance at a certain lecture and to staff as a pre-requisite to qualification for a raffle draw, a total of 1,433 were returned, showing the effectiveness of the incentives. The respondents were asked to tick the response which describes their level of agreement with the statements made. From the 1,433 questionnaires returned, 1,127 were considered useful for analysis, giving an effective response rate of 70.4 percent.

The respondents averaged 29 years in age and 1.7 years of experience in computer usage. The ratio of male to female was 2:3. About 21 percent had completed university and possessed a bachelor's degree, 16 percent had completed a masters or postgraduate schooling (Dunteman, 1989).

4. Data analysis and results

The analysis was done using the correlation matrix approach and a principal component factor analysis[1]. Only variables with eigen values over 0.6 are displayed. The results are analyzed below:

Data screening. The validity of data used in the analysis was first crosschecked for suitability for factor analysis; this was done by perusing the correlation matrix for any unrelated factors or non-relation of factors, the absence of which led to the check for conformity with the correlation value of less than 0.9 and greater than 0.1 prescribed by Fields (2004) and again the data were observed to be moderate. The Kaizer-Meyer-Olkin's (KMO) and Bartlett's test of sphericity, which was prescribed by Fields (2004) to have values greater than 0.5 for a correct factor analysis, was also done and the data had a KMO value of 0.662. (Henrysson, 1957)

Analysis. From the correlation matrix shown in Table I, it can be deduced that an inverse relationship exist between low level of citizens' and general awareness and the acceptability by organizations.

The degrees of effect caused by each factor which can be deduced from the different degrees of variance for which they account are shown in Table II.

To increase the accuracy of conclusions, the values of variables as depicted by the initial component matrix (Table III) was rotated using the Varimax method and normalized with the Kaizer normalization.

This is the pre-rotated component matrix. We further rotate to enhance precision and allow for accuracy in deduction-making.

Table IV shows the result after six iterations.

4.1 Rotated component matrix

In addition, to the relationship already observed earlier in the correlation matrix Table IV, the rotated component matrix table also shows a high loading for cost and general awareness (Garson, 2002).

Table V shows the component score coefficient matrix which help in understanding the weight (Rummel, 1970) of each of the loadings by making visible their degree of involvement as causes of the low level of acceptance of e-learning in Nigerian universities.

5. Discussion

The level of general or citizens' awareness appeared to be a major determinant of the acceptability of results and certifications from e-learning by organizations, which is commonsensical. The cost of implementation also appears to determine how well organizations in Nigeria will accept e-learning. Computer literacy is significantly affected by citizens' or general awareness since as the awareness level goes up, computer illiteracy level goes down.

More clearly, it can be seen that the acceptability by organizations is strongly affected by variables such as computer literacy level, citizens' awareness level and the low rate of diffusion of technologies into the university systems which are all strongly affected by the cost of executing such capital projects as e-learning centers. Thus, cost is the underlying factor responsible for the effect caused by the other factors. Cost can be measured in terms of money or the alternatives forgone.

The opportunity cost for such projects would include such alternatives as building more hostels, improving the very poor state of science laboratories, carrying out

Table I.

	Low level of acceptance by organization	Citizen's or general awareness	Low rate of diffusion of e-learning	High cost of implementation	Computer literacy	Students' resistance to e-learning	Vendor issues
Low level of acceptance by organizations	1.000						
Low level of citizens' or general awareness.	- 0.523	1.000					
Low rate of diffusion of e-learning	0.454	- 0.635	1.000				
High cost of implementation	- 0.231	0.279	- 0.083	1.000			
Computer literacy	0.508	- 0.535	0.367	- 0.413	1.000		
Students' resistance to e-learning	0.192	0.102	- 0.143	0.052	- 0.038	1.000	
Vendor issues	0.397	- 0.237	0.285	0.160	- 0.107	0.054	1.000

IMCS 14,5	Component		
	1	2	3
Low level of citizen's or general awareness	-0.852		
Low level of acceptability by organizations	0.792		
Rate of diffusion	0.750		
Computer literacy	0.731		
Vendor issues, platform providers, internet service providers		0.793	
High cost of implementation		0.637	
Students resistance to new technology			0.900

Table III.
Component matrix^a

Notes: Extraction method: principal component analysis; ^a three components extracted

502	Component		
	1	2	3
Rate of diffusion	0.806		
Low level of citizens' or general awareness	-0.786		
Low level of acceptability by organizations	0.757		
Vendor issues, platform providers, internet service providers	0.641		
High cost of implementation		0.790	
Computer literacy		-0.732	
Students resistance to new technology			0.941

Table IV.
Rotated component matrix^a

Notes: Extraction method: principal component analysis; rotation method: varimax with Kaiser normalization; ^arotation converged in five iterations

502	Component		
	1	2	3
Low level of acceptability by organizations	0.284	-0.061	0.324
Low level of citizens' or general awareness	-0.300	0.102	0.128
Rate of diffusion	0.351	0.080	-0.230
High cost of implementation	0.083	0.511	-0.048
Computer literacy	0.090	-0.418	0.034
Students resistance to new technology	-0.058	-0.037	0.830
Vendor issues, platform providers, internet service providers	0.356	0.451	0.116

Table V.
Component score coefficient matrix

Notes: Extraction method: principal component analysis; rotation method: varimax with Kaiser normalization

research, paying staff and the provision of transportation for staff and students, amongst other competing needs.

It can also be seen that the problems encountered in terms of vendor issues is accounted for by the low rate of diffusion of new technologies, which stems from the problem of the cost of acquiring such new technologies.

5.1 Limitation

This study has as its major limitation non-response bias, and an adequate measurement for computer proficiency.

6. Conclusive review

Increasing the level of e-learning's presence in Nigerian universities would solve the problems of overcrowding in lecture rooms and hostels, low lecturer to student ratios, insufficient laboratory equipment, cultism, too many applicants for too few schools and a lot more (Elearnframe, 2000), which has led the depreciation of the country's human resource and accounts for many of the social ills observed in the country today. Apparently, e-learning has the ability to provide a remedy for these problems, and should be encouraged in accordance with the policies of the government in Nigeria. This study therefore helps encourage e-learning by breaking down the problem of its low acceptance into identifiable and solvable units. The outcome of the research is as follows:

- the results demonstrate how the low level of computer literacy in the country's universities is caused by insufficient finance which underscores the claims made by university administrators in the country;
- it shows, by its results, that the problems of poor internet service quality, poor quality of software, software piracy and other vendor related issues have a reciprocal effect on the rate at which technology diffuses into the universities;
- it makes clear and uniquely identifies the low level of e-learning awareness in the country's universities as the major factor affecting its acceptance;
- it also shows that the high cost of e-learning infrastructure is the underlying factor responsible for the low level of e-learning awareness in Nigerian universities; and
- it is also obvious from the research that the level of Nigerian university students' resistance to e-learning is significantly low and ignorable.

From the outcomes of the research stated above, a good place to start in solving this problem would be the provision of adequate finance to universities which might be from the government, private or any other concerned bodies. Availing university administrators with adequate finance for the acquisition of necessary e-learning infrastructure and the establishment of e-learning centers in Nigerian universities should therefore be a front line issue in the country.

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Appendix

Here, some of the questions used to measure the different factors are shown. The structure of the questionnaire used for data collection is shown below:

Demographic questions

1. Please indicate your gender. Female Male
2. To which of the following age groups do you belong?
 under 18 18-24 25-34 35-44
 45-54 55-64 65-74 75 and older
3. Please indicate your marital status
 Single married Divorced widowed
4. What is the highest level of qualification you possess?
 Secondary school certificate bachelors degree post graduate degree in education masters PhD other

Scaled questions section

1. The cost of implementing e-learning is considerably low
 Strongly disagree Disagree Neutral Agree Strongly agree
2. I find it difficult to learn online
 Strongly disagree Disagree Neutral Agree Strongly agree
3. I am motivated to learn online
 Strongly disagree Disagree Neutral Agree Strongly agree
4. There are sufficient computers in the computer or information center in my school
 Strongly disagree Disagree Neutral Agree Strongly agree.
5. I have known about e-learning for a very long time
 Strongly disagree Disagree Neutral Agree Strongly agree
6. Most of my colleagues have utilized or are making use of e-learning
 Strongly disagree Disagree Neutral Agree Strongly agree
7. There exist reasonably fast and constant internet services in my school
 Strongly disagree Disagree Neutral Agree Strongly agree
8. How would you rate your proficiency at computer use?
 Very low Low Normal high Very high
9. How would you rate the frequency at which you surf the internet?
 Very low Low Normal high Very high

Non-scaled question section

1. Can you use Microsoft Word? yes no
2. Can you use any graphic packages? yes no
3. Can you design a web site? yes no
4. I own a personal computer yes no

Acceptability
of e-learning

505

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