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Full Length Research Paper

Assessment of the level of technological literacy among non-teaching staff in selected universities in Edo State, Nigeria

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ABSTRACT

The purpose of the study was to assess the level of technological literacy among non-teaching staff (NTS) in selected public universities in Edo State, Nigeria. Two research questions were raised to guide the study and two corresponding hypotheses were formulated and were also tested at 0.05 level of significance. A survey research design was used for the study. The population of the study comprised 1520 NTS obtained from both public and private universities in Edo State used for this study. A forty-item questionnaire structured on a five-point rating scale was the instrument used for data collection. The content and face validity of the instrument were carried out by experts in measurement and evaluation and a science educator A reliability coefficient of 0.80 was obtained. A reliability test of the instrument was also conducted and analysed using mean, standard deviation, and Z-test statistics. Findings show that non-teaching staff in Edo State selected universities possess moderate level knowledge of: (1) technological literacy, and (2) nature of technology. The study also revealed that there were high differences in technological skill levels between public and privately owned universities. Implication of the study was highlighted as being of great benefit to science and technology education planners and administrators, technical instructors and students. Based on the findings of the study, appropriate recommendations were made and if adopted it will enhance the level of technological literacy among non-teaching staff in universities in Edo State, Nigeria.

Keywords: Assessment, technology, literacy, non-teaching staff, universities.

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INTRODUCTION

The daily life of people in the world today is closely linked with science and technology. Moreover, the growth and development of any nation are hinged on the high technologically skilled labour force. It is the technological skills of the workforce that pave the way for creativity, innovation and higher productivity. Besides, the world today is passing through a lot of changes virtually in every field of human endeavor. These changes are no doubt more conspicuous in science and technology. For instance, the daily necessities, including means of transportation, architecture, communication, energy, power, computer programming, and other facilities are all closely bound up with science and technology.

This widespread application of technology has brought many benefits. For instance, it does not only save time but also is more efficient to send messages through fax or the internet, to withdraw or transfer money using an Automated Teller Machine (ATM), or to cook with a microwave oven or with an electromagnetic cooker. On the other hand, technology can have a negative impact on the

environment and human life. For example, chlorofluorocarbon (CFC), a coolant used in refrigerators and air conditioners, has thinned the ozone layer. Nuclear energy can also cause thermal pollution and radiation. Sitting in front of a computer may strain the user's eyes and lead to isolation from other workers and members of one's family. The development of technology forges ahead at such a tremendous pace that new products, services, and tools are constantly emerging. Living in a constantly changing era, one cannot assess technology or choose and use properly all sorts of technological products and services without a solid understanding of technology.

ITEA (2016) defined technological literacy as the ability to use, manage and understand technology. Technological literacy according to ITEA includes knowledge and skills on how to use, manage and understand technology and the benefits and risks of current and future technology. It comprises four components namely:

(i) The nature of technology
(ii) Technological skills
(iii) Human ingenuity
(iv) The impact of technology in the society

Yawson (2017) refers to technological literacy as offering people the tools to "engage intelligently and conscientiously in the world around them.

Miller (2018) sees technology as citizens being "embroiled in a complex process of ensembling". Authors such as these express technological literacy in the wider context of being more than the acquisition of any particular skill but related to how we live our lives. We are seen to exist within a technologically mediated world in which it is particularly the young whose experiences become dependent upon the nature of technology. Technological literacy becomes "an awareness of the impact of technology, both desirable and undesirable, upon humans at the level of both the individual and society" (Dow, 2020).

First, a technologically literate person must have a certain amount of basic technology knowledge. Second, a technologically literate person should have some basic technical capabilities, such as being able to work with a computer and identify and fix simple problems with the technological devices used at home and in the office. More generally, he or she should be able to employ an approach to solving problems that rely on aspects of a design process. A university is an institution of higher (or tertiary) education and research that awards academic degrees in various academic disciplines. Universities typically provide undergraduate education and postgraduate education. The word university is derived from the Latin phrase *universitas magistrorumet scholarium*, which roughly means "community of teachers and scholars. The objective of this study therefore was to assess the level of technological literacy among non-teaching staff across all the six universities in Edo State, Nigeria.

To this end, the study was set to determine the level of technological literacy of non-teaching staff in the selected universities, and specifically, the study determines the level to which non-teaching staff in the universities in Edo State possess.

i. Knowledge of the nature of technology.
ii. Knowledge of the impacts of technology on society.

To guide the study, the following questions were raised.

i. What is the level of technological literacy that male and female NTS in universities in Edo state possess?
ii. What level of knowledge of the nature of technology do junior and senior non-teaching staff in universities in Edo State possess?

The following null hypotheses were formulated and tested at a 0.05 level of significance.

H_{O1}: There is no significant difference in the mean rating between the male and female NTS in the level of technological literacy in the universities in Edo State.

H_{O2}: There is no significant difference in the mean rating between the Junior and Senior NTS on the knowledge of the nature of technological literacy in the universities in the Edo State.

This study would be of immense value to the management of teaching and non-academic staff of these universities as it would help them to know and understand the level of technological literacy. The study would provide valuable data to the management of universities in Edo State, Nigeria. It would enable the management of these universities to understand the level of technological literacy of non-teaching staff, thus providing a reference for future administrative design and planning.

METHODOLOGY

A survey research design was employed for the study. The researchers used copies of the questionnaire for the collation of data for the study.

The population of the study consisted of all the non-teaching staff of the six (6) universities in the State (both public and private). There are fifteen thousand two hundred (15,200) non-teaching staff in the universities in the State. This population was identified as contained in the personnel services in the respective universities. Both male and female non-teaching staff of the universities are under study. The sample size for this study was calculated using the hypothesis testing method.

The sample for the study consisted of 1520 non-teaching staff (NTS) drawn from the total population of 15200 from

the offices of the university personnel departments from the six universities in the state, which is ten percent (10%) of the entire population. The researchers used the purposeful sampling technique. The researchers picked samples that are representative of the population of interest.

The distribution of the sample size and type of universities are shown in Table 1.

Table 1. Distribution of samples by number of NTS in each of the universities in Edo State.

S/N	Institution	Sample total number of NTS	Male	Female	% Population
1.	University of Benin (UNIBEN), Benin City	500	250	250	32.8
2.	Ambrose Alli University (AAU), Ekpoma	410	205	205	26.97
3.	Edo University, Uzairu	120	60	60	7.89
4.	Benson Idahosa University, Benin City	210	105	105	13.81
5.	Igbenedion University, Okada, Benin	180	90	90	11.84
6.	Samuel Adegboyega University (SAU), Ogwa, Ekpoma	65	50	50	4.27
	Total	**1520**			**100**

Source: University Personnel Departments.

The instrument for data collection was a structured questionnaire designed by the researchers. The questionnaire consisted of two sections:

i. Section A deals with the background information of the respondents which includes: gender, Status, type of university, and location of the universities.
ii. Section B of the instrument comprised 40 items arranged under four sections, such that subjects respond to a 5-point rating scale; Very high level (VHL), high level (HL), moderate level (ML), low level (LL), and very low level (VLL).

Validity of the instrument

Validity refers to the degree to which an instrument measures what it is supposed to be measuring. The researcher submitted the questionnaire together with the research topic, research questions, and hypotheses to two experts in Technology Education and an expert in measurement and evaluation at Ambrose Alli University, Ekpoma. Their inputs were used to moderate and modify the instrument to ensure its appropriateness in imploring the opinion of the respondents.

Reliability of the instrument

Reliability of the instrument was established using a test re-test method. Copies of the questionnaire for the study were administered to 20 respondents drawn from two universities namely UNIBEN and BIU. The same instrument was administered to the same respondents two weeks later as a re-test. The coefficient of reliability for their responses was established using the Pearson product-moment correlation coefficient formula. A reliability coefficient of 0.80 was obtained and this was considered high enough for the instrument to be considered.

Data collection

The data were collected by the use of a questionnaire designed by the researchers.

Data analysis

Descriptive statistics of arithmetic mean and standard deviation were used to analyse the research questions. The standard deviation serves the purpose of depicting how widely the scores in the distribution spread out around the mean value of all the scores. Inferential statistics, that is z-test, was used to analyse all the hypotheses at 0.05 level of significance**.**

Decision rule

For the research questions, a boundary limit of numbers was used to determine the level of technological literacy, knowledge, and skills possessed by non-teaching staff as follows:

Very high level	5	4.50 – 5.00
High level	4	3.50 – 4.49
Moderate level	3	2.50 – 3.49
Low level	2	1.50 – 2.49
Very low level	1	1.00 – 1.49

Hypotheses testing

The results of the null hypotheses in this study are presented as follows:

Hypothesis 1

There is no significant difference between male and female NTS levels of technological literacy in universities in Edo State. This null hypothesis was tested using a z-test and at a 0.05 level of significance, as indicated in Table 2.

The calculated value of the computation stood at z = 3.90 at 0.05 level of significance and at df = 1498 (z-cal = 3.90, z- crit = 1.966, p = 0.05, df = 1498). This is shown in Table 2. Since the calculated z-value of 3.90 is greater than the z-critical or table value of 1.96, the null hypothesis is rejected. This indicated that there is significant difference in the mean rating of male and female NTS in universities in Edo State, Nigeria on technological literacy as a result of gender.

Table 2. The z-test analysis of male and female NTS mean rating of their level of technological literacy as a result of their gender.

Sex	N	$\bar{x}$	S.D	DF	Level of Sig	Level of Z-cal	Z-critical	Decision
Male	760	4.65	0.829	1498	0.05	3.90	1.966	Ho Rejected
Female	760	4.32	1.017					

Hypothesis 2

There is no significant difference between junior and senior NTS in universities in Edo State, Nigeria on level of knowledge of the nature of technology. This null hypothesis was tested using z-test and at a 0.05 level of significance, as indicated in Table 3.

The calculated value of the computation stood at z = 3.71 at a 0.05 level of significance and at DF = 1498 (z-cal = 3.71, z-crit = 1.966, p = 0.05, DF = 1498). This is shown in Table 3. Based on this, the null hypothesis was rejected and therefore concluded that there is a significant difference in the mean rating of junior and senior NTS in universities in Edo State, Nigeria on the level of knowledge of the nature of technology due to status.

Table 3. The z-test analysis of junior and senior NTS mean rating of the level of knowledge of the nature of technology as a result of their status.

Status	N	$\bar{x}$	S.D	DF	Level of Sig	Level of Z-cal	Z-critical	Decision
Junior	760	4.10	0.7303	1498	0.05	3.71	1.966	Ho Rejected
Senior	760	3.84	0.9581					

DISCUSSION

The result of hypothesis one states that there is no significant difference between male and female NTS levels of technological literacy in universities in Edo State, Nigeria. The study revealed that there was a significant difference between the male and female levels of technological literacy in universities in Edo State, Nigeria. This result is in agreement with the findings of Adeyoyin (2006) carried out in Anglophone countries who found that the administrative staff have a low level of technological literacy; and that the male administrative staff have a higher level of technological literacy compared to their female counterpart. The implication of this is that in an office where the administrative staff is dominated by the female folk, there would be a kind of a low level of output.

The result of hypothesis two which state that there is no significant difference between Junior and Senior NTS in universities in Edo State on the level of knowledge of the nature of technology showed that there was a significant difference in the mean rating of junior and senior NTS in universities in Edo State on the level of knowledge of the nature of technology due to status. This result tends to corroborate the findings of Anunbi (2004) on computer literacy of NTS in Edo State which revealed that younger professionals with few years in service possess ICT skills more than their older counterparts. This could be attributed to the high level of technological advancement parading

the world in the 21st century.

Conclusion

The concept of computer literacy has changed over the past three decades along with the availability of new technologies to everyone. However, not everyone is exposed to the same level of technology sophistication in business organizations, but we can assert that everyone is in direct contact with a computer in today's business environment. In addition, the study of computer literacy has been instrumental in determining the impact of technology on increasing productivity and efficiency levels (Waetjen, 2016). Therefore, it is of great importance to continue assessing the computer literacy levels of different groups to better understand how individuals develop new knowledge to keep abreast and current, to the benefit of business organizations. Business organizations need employees with updated knowledge and skills. Today's dynamic environments rely on the workforce to keep up with technological changes and to self-teach about such changes (Wright, 2018). The age of information technology has transformed all economies of the world, and it has redefined the role of individuals in business organizations. Moreover, the diverse generational composite has embraced new information technologies in different ways. While some individuals continue to resist changes in the workplace, others embrace it as the new way to achieve higher efficiencies and innovations.

Ratiocination from the study was based on the interpretation of data and discussions of findings. Sequitur to the findings of the study, the following conclusions were drawn:

1. The level of technological literacy of NTS in universities in Edo State, Nigeria is on a moderate and high level.
2. The nature of technology is on a moderate level.

There is a gap in technological literacy levels between male and female NTS in the universities in Edo State, Nigeria. In light of this, it becomes pertinent to encourage female personnel to enroll in technology and computer education to cope with the modern and fast-changing technological society.

RECOMMENDATIONS

Sequence to the discussion of findings and cogitations deduced from the level of technological literacy among NTS in universities in Edo State, the following recommendations were made:

1. The governing councils and management of the universities in Edo state should make available adequate technological infrastructure in their universities and as well allocate fund for staff training and development.
2. NTS staff with a higher level of ICT skills should not feel reluctant to share such knowledge with colleagues, and inexperience staff, and "newbies" as well should be ready to receive training by embracing change and not been conservative.
3. Universities should initiate the effort to revamp and redesign the library and information science curriculum to one that will accommodate development in information and communication technology.
4. Professional bodies and stakeholders in Science and Technology Education should initiate specialized seminars or workshops that will focus on training librarians for ICT competencies required for the dynamic information services of today information society.

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