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# Perceptions of the Use of Digital Libraries System Among Undergraduates of Selected Federal Universities in Southwest, Nigeria

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## ABSTRACT

The study examined the perceptions of the use of digital libraries system among undergraduates from the Federal University of Technology, Akure, Ondo State, and the Federal University of Agriculture, Abeokuta, Ogun State, Southwest, Nigeria. The study adopted the Technology Acceptance Model as a theoretical framework. Purposive sampling was used to select 100 undergraduates from the selected federal universities, and a questionnaire was adopted as the data collection instrument. The test of normality suggests a need for non-parametric statistics. Hence, the median was used to describe the average values, and ordinal regression analysis was used to test the hypotheses. The findings revealed a significant influence of perceived ease of use ( $p < 0.05$ ) and perceived usefulness ( $p < 0.05$ ) on the use of digital libraries system by undergraduates. However, perceived usefulness exerted more influence on the use of digital libraries than perceived ease of use. Therefore, the study recommends user-friendly interfaces for the digital libraries system of the selected institutions.

**Keywords:** Digital libraries system, Technology acceptance model, Perceived usefulness, Perceived ease of use, Nigerian universities

## Introduction

Evolution in technology has changed the way undergraduates engage with library resources. The traditional reliance on physical books and resources is gradually declining, with a shift toward a digital landscape. The increasing availability of internet access and the need for digital literacy in academic institutions have also contributed greatly to the rise of digital libraries. Digital libraries include diverse repositories of scholarly articles, multimedia resources, e-books, and archival materials, among others. With digital libraries, undergraduates in different parts of the world can access global information, irrespective of geographical, time, or financial constraints. This also implies that undergraduates could search for information from different library collections on their devices, bypassing the limitations of traditional libraries.

A digital library can be viewed as a library management process that adopts digital technology assistance in collecting, recording, disseminating, and storing information.<sup>1</sup> Digital library services are similar to traditional libraries. The major differences include the digital format used in digital library services, accessibility from any location, and use of less space for storage with network availability for the internet.<sup>2</sup> In recent times, the digital library has become indispensable resources for undergraduates, enhancing their academic experience. Embedded in it are powerful search tools

that simplify the search and retrieval of library materials. This helps students to save valuable time when finding relevant information from the library. It is also a quicker and more efficient means to access and organize information for assignments and projects. In addition, students can easily cross-reference materials from different fields, thereby encouraging interdisciplinary study. This implies that collaboration could also be enhanced. Many digital library applications support the sharing of insights and discussion among students in real time.

This advantage often led to richer learning experiences as students gained collective knowledge from diverse perspectives. Digital library resources also encourage the development of information literacy skills. A lot of digital library applications provide guides on citation styles and academic writing and research. This helps to improve the research skills of the students as well as prepare them for some of the future challenges in their academic pursuits.

Nevertheless, the challenges associated with a transition to digital formats are also associated with the use of digital libraries. Undergraduates need to learn how to navigate the complexities of the application design in order to derive the benefits. Hence, the skills required to access digital content are essential requirements for prospective users of digital libraries. A lot of institutions in Nigeria recognize the need for the acquisition of these skills and are placing a stronger emphasis on digital information literacy. Although many vendors of different digital libraries' applications have improved on the interactive interfaces for enhanced user experience, assumedly, undergraduates are likely to use digital library systems based on their perceived ease of use and perceived usefulness of the system.

In line with the above sentiment, our theoretical framework for this study is the Technology Acceptance Model (TAM).<sup>3</sup> The model was adopted for more insight in examining the potential effect of perceived ease of use and perceived usefulness on the use of digital library systems. Many scholars have focused on the use of digital libraries from the perspective of TAM.<sup>4-6</sup> However, little has been done on the use of digital libraries from the user's perspective in Southwest, Nigeria. Therefore, this article focuses on the perceptions of the use of digital libraries system among undergraduates of discipline-based federal universities in Southwest, Nigeria. There are two discipline-based federal universities in Southwest, Nigeria. These are the Federal University of Technology, Akure, and the Federal University of Agriculture, Abeokuta. Both institutions were selected for a focused study on perceptions of the use of digital libraries system in only discipline-based

federal universities in Southwest, Nigeria. The specific objectives were to:

1. assess the level of perceived ease of use of digital libraries system among undergraduates of selected federal universities in Southwest, Nigeria;
2. assess the level of perceived usefulness of digital libraries system among undergraduates of selected federal universities in Southwest, Nigeria;
3. examine the significant relationship between perceived ease of use of digital libraries system and actual use of digital libraries system among undergraduates of selected federal universities in Southwest, Nigeria; and
4. examine the significant relationship between the perceived usefulness of the digital libraries system and the actual use of the digital libraries system among undergraduates of selected federal universities in Southwest, Nigeria.

This article addressed the following research questions:

1. What is the level of perceived ease of use of the digital libraries system among undergraduates of selected federal universities in Southwest, Nigeria?
2. What is the level of perceived usefulness of the digital libraries system among undergraduates of selected federal universities in Southwest, Nigeria?

Based on the third and fourth objectives of the study, the authors hypothesized as stated below.

H1: There is no significant relationship between perceived ease of use of the digital libraries system and actual use of the digital libraries system among undergraduates of selected federal universities in Southwest, Nigeria

H2: There is no significant relationship between the perceived usefulness of the digital libraries system and the actual use of the digital libraries system among undergraduates of selected federal universities in Southwest, Nigeria

### Literature Review

The TAM was introduced by Fred Davis in 1986 and has its roots in the theory of reasoned action and the theory of planned behavior.<sup>6,7</sup> According to TAM, an individual's intention to use a technology is determined by perceived ease of use and perceived usefulness. Perceived ease of use explains the degree to which an individual believes that using a technology is effortless. Perceived usefulness, on the other hand, explains the degree to which an individual believes that using a technology will enhance their job performance. It is the potential user's subjective likelihood that the use of a technology will improve the user's action.<sup>7,8</sup>

In a study on the use of electronic library services among students at Mzuzu University Library, findings suggest that the perceived usefulness of e-library

services was high while the perceived ease of use was low because the students perceived the skills for accessing the services as not satisfactory.<sup>9</sup> In a qualitative approach to ensuring continued use of a digital library, another study revealed that perceived usefulness and perceived ease of use are important in shaping users' behaviors toward digital library systems.<sup>10</sup> However, these two determinants are influenced by the quality of the system offered and the level of instrumental support provided by the organization. If a digital library has good navigation and a simple interface that is well organized, users will be interested in using it.

In another study on the use of the Higher Education Commission digital library of Pakistan, findings showed that perceived usefulness and perceived ease of use have a significant influence on users' adoption of the digital library.<sup>11</sup> Nevertheless, the influence of perceived usefulness is stronger than perceived ease of use. This suggests that the users perceive the use of the digital library as a valuable resource. The findings also suggest that perceived ease of use alone is not sufficient to increase digital library usage; the digital library system must also be useful. In a related study on the adoption of library information systems using the TAM, both perceived usefulness and perceived ease of use influenced the intention to use digital libraries.<sup>4</sup> However, there is a difference in the explanatory power of their relative strength. Findings indicate that perceived usefulness was a much stronger determinant of the adoption of library information systems than perceived ease of use.

Another study on predictors of digital library usage by undergraduate students at a Namibian University revealed that perceived ease of use has no significant association with the perceived usefulness of the digital library.<sup>5</sup> Also, there was no evidence of an association between perceived ease of use and actual use of digital libraries, as hypothesized in the study. However, there was an association between perceived usefulness and actual use of the digital library. In a different but related study on determinants of user acceptance of digital libraries, the authors proved that their findings indicated the appropriateness of using TAM to understand the intention of students to use digital libraries.<sup>6</sup> The findings indicated a significant influence of both perceived usefulness and perceived ease of use on the intention to use digital libraries. However, perceived usefulness exerted a stronger influence than perceived ease of use of digital libraries.

Generally, it is expected that perceived usefulness would have a direct impact on adoption intention, as users are likely to be more willing to use a system if there were provisions for valuable functions. Nevertheless, perceived ease of use is expected to influence both adoption intention and perceived usefulness. Users are likely to find a system useful if it is easier to interact with and hence intend to use such a system.<sup>4</sup>

### Methods

The study adopted a survey research design. The study population comprised about 36,000 undergraduates

from the selected federal universities in Southwest, Nigeria, which are the Federal University of Technology, Akure, and the Federal University of Agriculture, Abeokuta. According to the records gathered from both institutions, there were about 19,000 undergraduates at the Federal University of Technology, Akure, and about 17,000 undergraduates at the Federal University of Agriculture, Abeokuta. Using a non-probabilistic approach due to the lack of accurate figures on the total population of the study, purposive sampling was used to select 100 undergraduates from these two institutions. A total of 64 undergraduates were purposively selected from the Federal University of Technology, Akure, and 36 undergraduates were purposively selected from the Federal University of Agriculture, Abeokuta. The questionnaire was used as an instrument of data collection. The questionnaire elicited information about the use of the digital libraries system, perceived ease of use of the digital libraries system, and perceived usefulness of the digital libraries system. A modified Likert scale was used

for the five items on perceived ease of use and perceived usefulness. The IBM Statistical Package for Social Sciences version 27 was used for data analysis.

### Normality Test

The Kolmogorov-Smirnov test was used to check whether or not the dependent variable (use of the digital libraries system) is normally distributed.

As shown in Table 1, the Kolmogorov-Smirnov test was statistically significant for the use of the digital libraries system ( $p$ -value = 0.00), which suggests that the dependent variable is not normally distributed. Hence, the median (non-parametric statistics) was used to describe the average values.

### Results and Discussion of Findings

Out of the 100 copies of the questionnaire administered and received from sampled undergraduates in both institutions, a total of 94 respondents made use of digital libraries, while the remaining 6 did not use digital libraries.

**Research Question One:** What is the level of perceived ease of use of the digital libraries system among undergraduates of selected federal universities in Southwest, Nigeria?

According to Table 2, most of the participants perceived the digital libraries system to be easy to use. The median value of all the items used to measure the perceived ease of use of digital libraries (median = 3) also indicates that the undergraduates of the selected federal universities in Southwest, Nigeria perceived the digital libraries system to be easy to use.

**Research Question Two:** What is the level of perceived usefulness of the digital libraries system among undergraduates of selected federal universities in Southwest, Nigeria?

As shown in Table 2, a lot of the participants perceived the digital libraries system to be useful. The median value, which is also 3, suggests that the undergraduates of the selected federal universities in Southwest, Nigeria perceived the digital libraries system to be useful.

### Test of Hypotheses

A non-parametric test, using ordinal regression analysis, was conducted to test hypotheses one and two. A non-parametric test was chosen because the data were not normally distributed (as shown in the Kolmogorov-Smirnov test), and the assumption for the parametric test was not met.

### Hypothesis One

H1: There is no significant relationship between perceived ease of use of the digital libraries system and actual use of the digital libraries system among undergraduates of selected federal universities in Southwest, Nigeria

The result of the model fitting information of the ordinal regression analysis in Table 3a shows a good fit

**Table 1 | Test of normality**

	Kolmogorov-Smirnov <sup>a</sup>		
	Statistic	df	Sig.
Use of the digital libraries system	0.539	100	0.000

Note: 'a' indicates a one-sample Kolmogorov-Smirnov test conducted to assess the significant difference between a sample distribution and a normal distribution.

**Table 2 | Perception of use of digital libraries system**

Perceived ease of use (PEOU)	Always	Sometimes	Rarely	Never	Median
It is easy for me to interact with the digital library	77 (77.0%)	18 (18.0%)	4 (4.0%)	1 (1.0%)	4
It is easy for me to get information from the digital library	16 (16.0%)	52 (52.0%)	24 (24.0%)	8 (8.0%)	3
It is easy for me to understand my interaction with the digital library	47 (47.0%)	28 (28.0%)	17 (17.0%)	8 (8.0%)	3
It is uncommon for me to make a mistake when using the digital library	17 (17.0%)	42 (42.0%)	14 (14.0%)	27 (27.0%)	3
From all indications, the digital library is easy for me to use	40 (40.0%)	23 (23.0%)	26 (26.0%)	11 (11.0%)	3
<b>PEOU Median</b>					<b>3</b>
Perceived usefulness (PU)	Always	Sometimes	Rarely	Never	Median
The use of digital libraries improves the effectiveness of my academic work	54 (54.0%)	31 (31.0%)	11 (11.0%)	4 (4.0%)	4
The use of digital libraries improves the quality of my academic work	27 (27.0%)	50 (50.0%)	20 (20.0%)	3 (3.0%)	3
The use of digital libraries makes it possible for me to successfully complete tasks faster	35 (35.0%)	26 (26.0%)	22 (22.0%)	17 (17.0%)	3
The use of digital libraries makes it easier to do my academic work	33 (33.0%)	42 (42.0%)	10 (10.0%)	15 (15.0%)	3
From all indications, the digital library is useful for my academic tasks	39 (39.0%)	26 (26.0%)	20 (20.0%)	15 (15.0%)	3
<b>PU Median</b>					<b>3</b>

**Key:** Always (4), Sometimes (3), Rarely (2), Never (1)

**Decision rule:** <2 is low; >2 is high

**Source:** Researchers' Field Survey, 2024

**Table 3a | Perceived usefulness and use of digital libraries system**

Model Fitting Information				
Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	44.862			
Final	31.184	13.678	2	0.001
Goodness-of-Fit				
		Chi-Square	df	Sig.
Pearson		6.853	4	0.144
Deviance		8.704	4	0.069
Pseudo-R-Squared				
Cox and Snell	0.128			
Nagelkerke	0.144			
McFadden	0.063			

**Table 3b | Perceived usefulness and use of digital libraries system**

Parameter Estimates							
						95% Confidence Interval	
	Estimate	Std. Error	Wald	df	Sig.	Lower Bound	Upper Bound
Location PU = 2	-2.275	0.645	12.455	1	0.000	-3.539	-1.012
PU = 3	-1.150	0.485	5.614	1	0.018	-2.101	-0.199
PU = 4	0 <sup>a</sup>		0				
Test of Parallel Lines <sup>a</sup>							
Model	-2 Log Likelihood	Chi-Square	df	Sig.			
Null Hypothesis	31.184						
General	22.480	8.704	4	0.069			

Note: 'a' refers to the p-value (significant value) of the test.

**Table 4a | Perceived ease of use and use of digital libraries system**

Model Fitting Information				
Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	41.067			
Final	33.068	8.000	2	0.018
Goodness-of-Fit				
		Chi-Square	df	Sig.
Pearson		8.079	4	0.089
Deviance		10.723	4	0.030
Pseudo-R-Squared				
Cox and Snell	0.077			
Nagelkerke	0.087			
McFadden	0.037			

**Table 4b | Perceived ease of use and use of digital libraries system**

Parameter Estimates							
						95% Confidence Interval	
	Estimate	Std. Error	Wald	df	Sig.	Lower Bound	Upper Bound
Location PEOU = 2	-1.481	0.599	6.106	1	0.013	-2.655	-0.306
PEOU = 3	-1.082	0.482	5.043	1	0.025	-2.027	-0.138
PEOU = 4	0 <sup>a</sup>		0				
Test of Parallel Lines <sup>a</sup>							
Model	-2 Log Likelihood	Chi-Square	df	Sig.			
Null Hypothesis	33.068						
General	22.344	10.723	4	0.030			

Note: 'a' refers to the p-value (significant value) of the test.

of the influence of perceived usefulness on actual use of the digital libraries system among undergraduates of selected federal universities in Southwest, Nigeria. Also, the result of the goodness-of-fit ( $p > 0.05$ ) for both the Pearson and Deviance tests indicate that the model adequately fits the data. This implies that there is a significant difference between the observed data and the fitted (assumed) model. In addition, the result of the pseudo-R-squared (Nagelkerke = 0.144) shows there has been a 14.4% improvement in the prediction of use of the digital libraries system based on the perceived usefulness of the digital libraries system in comparison to the null model.

Table 3b reveals the parameter estimate of the model. The test of parallel lines indicates the assumptions of ordinal logistic regression, and it is expected that the effects of the predictors will be the same across the levels of the dependent variable. Hence, the p-value is expected to be insignificant. The result in Table 3b shows that the test of the parallel line is not significant ( $p > 0.05$ ). Therefore, the assumption is not violated.

By using participants who always perceived the digital libraries system as useful as the reference point, the parameter estimates reveal that those with lower perceptions of the usefulness of the libraries system have lower usage of the digital libraries system (estimate = -2.275, -1.150). This implies that the odds of increasing the use of the digital libraries system decrease if there are lower perceptions of its usefulness. The results also show a significant relationship between perceived usefulness and actual use of the digital libraries system ( $p < 0.05$ ). Therefore, the null hypothesis, which states that there is no significant influence of perceived usefulness on actual use of the digital libraries system among undergraduates of selected federal universities in Southwest, Nigeria, is rejected.

## Hypothesis Two

H2: There is no significant relationship between the perceived usefulness of the digital libraries system and actual use of the digital libraries system among undergraduates of selected federal universities in Southwest, Nigeria

The model fitting information in Table 4a also shows a good fit [ $(X^2(2) = 8.000, p = 0.018)$ ] between the data and the model. That is, the final model is a significant improvement in fit over a null model. For the goodness-of-fit, Pearson's chi-square test reveals that the model does not fit the data well [ $(X^2(4) = 8.079, p = 0.089)$ ], whereas the Deviance chi-square test reveals a good fit [ $(X^2(4) = 10.723, p = 0.030)$ ]. This implies that the results are somehow mixed. More so, the result of the pseudo-R-squared (Nagelkerke = 0.087) indicates an 8.7% improvement in the prediction of use of the digital libraries system based on the perceived ease of use of the digital libraries system in comparison to the null model.

As shown in Table 4b, the test of parallel lines is significant ( $p < 0.05$ ), indicating that the assumption is violated. However, the results of parameter estimates

[( $X^2(2) = 13.678, p = 0.001$ )] between the data and the model. That is, there is a significant difference between the intercept-only model and the final model in terms



indicate a significant relationship between perceived ease of use and use of the digital libraries system among undergraduates of selected federal universities in Southwest, Nigeria ( $p < 0.05$ ). Using participants who always perceived the the digital libraries system as easy to use as the reference point, the parameter estimates reveal that undergraduates with lower perceptions of the ease of use of the libraries system also have lower usage of the digital libraries system (estimate =  $-1.481, -1.082$ ). Hence, the odds of increasing the use of the digital libraries system also decrease if there are lower perceptions of the ease of use of the digital libraries system. Based on the results of the parameter estimates, the null hypothesis, which states that there is no significant influence of perceived ease of use on actual use of the digital libraries system among undergraduates of selected federal universities in Southwest, Nigeria is rejected.

The findings of this study show that the TAM is appropriate for testing the perception of use of the digital libraries system among undergraduates. The findings revealed that both perceived usefulness and perceived ease of use are predictors of use of digital libraries. This supports the findings of previous studies reviewed.<sup>4,6,11</sup> Also, in alignment with the reviewed literature, the findings revealed that perceived usefulness exerted a stronger influence than perceived ease of use as a determinant of use of the digital libraries system. This indicates that the usefulness of the digital libraries system is more important to undergraduates than the ease of use. However, the findings of this study diverge from the findings of another reviewed literature, which suggests that perceived ease of use has no association with the use of digital libraries.<sup>5</sup>

### Conclusion

This study was carried out to investigate the perceptions of the use of the digital libraries system among undergraduates of the Federal University of Technology, Akure, and the Federal University of Agriculture, Abeokuta. The study showed that both perceived usefulness and perceived ease of use influenced the use of the digital libraries system. Nonetheless, the influence exerted by perceived usefulness was stronger when compared to that exerted by perceived ease of use.

Hence, the findings suggest the appropriateness of the TAM and contribute to understanding users' perceptions of the digital libraries system.

The findings suggest a need for an easy-to-use digital libraries system in the selected federal universities. It is, therefore, recommended that management focus on user-friendly system interfaces. Training sessions could be organized for the users on how to interact with the digital libraries system. A further study on user experience could also be helpful in giving more insights into the perceived ease of use of the digital libraries system of these institutions.

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