



Open Textbooks Utilization by Undergraduate Library and Information Science Students in Delta State University, Nigeria

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Abstract

The study examined open textbooks utilization by undergraduate Library and Information Science students at Delta State University, Abraka, Nigeria. The study's population consisted of 447 students. The sample size of 220 was adapted using the Taro Yamane sampling technique. The instrument used to collect data was the questionnaire. The validity of the instrument was determined using Cronbach's Alpha and got 0.79. The quantitative data were analyzed using SPSS version 29. The study reveals that LIS undergraduate students have a high level of awareness and usage of open textbooks. The Diffusion of Innovations theory confirms the role of awareness as an important stage in innovation adoption (open textbooks). The study found a substantial association between LIS undergraduate students' awareness and utilization of open textbooks. With increasing awareness, students are likely to conduct more research and use open textbooks. Based on the findings, it was suggested that the university management and instructors from LIS should develop sustained efforts towards promoting open textbooks among students. Attempts should also be made to improve the campaigns so that students are aware of the availability and advantages of open textbooks. Working with publishers and stakeholders in implementing open textbooks adoption into other departments or academic programs is also recommended.

Keywords: Open textbooks, Utilization, Library and Information Science students, Delta State University, Abraka

Background

Traditional textbooks have been a crucial source of information and learning materials for undergraduate students; these books are normally published by commercial entities. Over the years, traditional textbooks have become so expensive to acquire, and this has caused challenges relating to cost for students (Vander-Waal et al., 2019). The costs have skyrocketed over the past decade and are now at a point where most students cannot afford these valuable resources. The number of students who avoid purchasing the necessary textbooks continues to grow due to financial constraints (Martin et al., 2017). The prohibitive cost of textbooks has caused several

obstacles that prevent students' access to crucial learning resources, which can lead to deleterious effects on the level of achievement and performance. Not only does this financial burden hamper student's ability to effectively absorb course materials, but it casts doubts on the overall quality of education and fair distribution of knowledge. This situation created a basis for the open access effort (Salager-Meyer, 2012; Oren, 2008) and growing interest in using open textbooks as an alternative.

Open textbooks which is a subset of OER, serve as a potentially revolutionary answer to problems associated with traditional textbooks (Unesco, 2017). The open textbook initiative was established in 2013 as

a direct answer to skyrocketing prices of commercial print textbooks. Open textbooks are free online books, open to anyone to access, download and use. They are open copyright licensed books that permit the reuse, revision, remixing, and sharing by others (Wiley et al., 2012). Unlike published traditional textbooks that are often quite costly, open textbooks grant free access to high-quality learning materials for both students and lecturers. Open textbooks are produced by teachers and experts who openly license their work for free access, use as well as modification of the materials. There are versions of these books in electronic formats that can be accessed by undergraduate students who have Internet networks. Through open licensing students are able to download, read and even print the textbooks for free or at a considerably lower price than those that are commercial (Diener et al., 2017). This progressive method not only eradicates the financial constraints but also offer collective as well as a flexible learning atmosphere of sharing and advancement into the educational culture can be benefited.

Open textbooks in higher education has been recognized and accepted in different fields internationally. Ogunbodede et al. (2021) pointed out that with the help of the Internet, open textbooks have been actively used by students who get higher degrees, and international availability of high-quality content has been offered. Other positive experiences resulting from open textbooks include an increase in student learning facilitated by open textbooks reducing costs that are imposed on learners, and increasing the access concerning academic materials. Increased acceptance of open textbooks among undergraduate students has been influenced by the benefits associated with them. The use of open textbooks addresses the financial barriers that limit access to learning resources because they are more affordable compared to traditional books. Similarly, the online platform that open textbooks provide enables searchability for information; it also makes multimedia integration possible to elevate learning (Tsang et al., 2013). Still, there are differences between the adoption and utilization among countries or education systems.

There has been successful adoption of OER, particularly open textbook in advanced nations such as the United States and Canada. For example, the Open Textbook Network in the U.S. has greatly supported the use of these learning aids enhancing students' interest and learning achievements (Fagbola et al., 2023). Likewise, in South Africa, the use of OER has revolutionized instructional practice by making

diverse culturally appropriate resources available tailored to local needs (Abdous, 2024; Lelliott, 2020). In Ghana, the use of open textbooks has been encouraged by the high cost of traditional textbooks coupled with government driven project such as Ghana Open Data Initiative to enhance on the use of digital materials. Presently, the Ghanaian government, supported by UNESCO are making efforts in enhancing the availability and quality of educational materials through several initiatives such as translating literature and educational content into local language to enhance their accessibility (UNESCO, 2023). Senegal is also on the progressive drive towards digital transformation through the creation of Open University of Senegal. Research has shown that the university has positively contributed to the distribution and use of open textbooks and other digital education resources (Diallo et al., 2019).

In the Nigerian context, undergraduate learners have problems getting access to suggested books because they are expensive, and difficult to find their copies in their institution libraries (Edem & Okwilagwe 2012; Edem et al., 2009). These barriers can greatly impact the results of learning. Although open textbooks provide an alternative, multiple factors are likely to hinder their effective utilization among undergraduate university students. Some of the challenges include low levels of understanding and awareness about OER, poor digital infrastructure, and lack of adequate institutional support for the adoption of open textbooks. Sawyerr-George et al. (2022) claim that the effective usage of open textbooks depends largely upon students' awareness levels. However if such students are not informed of the open textbooks availability, they may struggle to find them and incorporate them in their academic activities. Therefore, identifying and tackling these obstacle is vital for implementing strategies that promote the effective use of open books in Nigerian higher institutions.

Open textbooks utilization could be an example of a potential solution, which would help to overcome the problems associated with conventional textbook access. Ironically, there are lack of studies that focuses on how much Library and Information Science undergraduate students use openly licensed textbooks as they are at the centre of managing access to information. This study intends to fill this knowledge gap by conducting this study. Researching their awareness and usage of open textbooks could offer insights into their attitudes towards OER as well as how they can play a part in promoting the use of

OER not only within their institution but also for the entire nation. This knowledge can also be used to guide curricular development, training of librarians, and OER incorporation into library services.

Statement of the Problem

The use of open textbooks by undergraduate students presents several potential advantages. The open textbooks were designed to boost the affordability of higher education by lowering student costs and reducing financial strain on post-secondary institutions. However, while open textbooks might seem as an alternative option, certain barriers may impede their widespread use by undergraduates in Nigerian universities. Some of these barriers are low awareness and understanding of OER, inadequate infrastructure, and a lack of official backing for the utilization of open textbooks. The effective utilization of open textbooks is reliant upon students' awareness, as many may face difficulties incorporating these resources if they are not aware of their existence. Therefore, identifying and handling these hurdles is key for implementing strategies that promote the effective use of open books in Nigerian. The use of open textbooks can be used to address financial limitations faced by undergraduate students in Nigerian universities. Nevertheless, there is hardly any research exploring how open licensed textbooks are used by LIS undergraduate students who act as vital agents in ensuring information access. This research, as such fills this knowledge gap by exploring LIS undergraduate students' awareness and usage of open textbooks at the Delta State University Abraka.

Research Questions

- i. What is the level of awareness of open textbooks by LIS undergraduates?
- ii. What is the level of usage of open textbooks by LIS undergraduates?
- iii. Is there any association between LIS undergraduates' awareness and utilization of open textbooks?

Research Hypothesis

- i. There is no substantial association between LIS undergraduates' awareness and utilization of open textbooks

Literature Review

Open textbooks are freely available online and can be printed, shared, and edited. They offer university students digital access to free learning content as an alternative approach to conventional textbooks. Their

cost-cutting and flexible nature makes them beneficial for accessibility and innovation in education.

Students' awareness of open textbooks

The study by Dsouza (2022) investigated the perception and utilization of OER by students of St. Joseph Engineering College Mangaluru. Altogether, 200 questionnaires were distributed and only 20 out of 200 (14.49%) students mentioned that they have heard about open textbooks. Likewise, Wiche & Ogunbodede (2021) examined the level of awareness and the use of OER by LIS Students in IAUE, Rivers State Nigeria. The study found that the students have a high knowledge of OER including open textbooks. Obinyan et al. (2023) explored the use of OER among the undergraduates from three universities in Nigeria. From a survey of 600 participants, the study established that 456(76%) of them had heard about open textbooks. In another study, Prasad & Usagawa (2014) looked at the attitude that students have towards open textbooks in implementing e-learning. According to the work done, one got high acceptance toward open textbooks usage. In summary, the level of awareness about open textbooks among students across these studies, ranges from as low as 14.49% to as high as 76%. The study conducted by Obinyan et al. (2023) in Nigeria revealed a relatively high level of awareness. Moreover, Prasad & Usagawa (2014) showed a positive attitude and acceptance of the open textbooks for e-learning.

Students' utilization of open textbooks

Bliss et al. (2013) focused on the views of the students learning from open textbooks with regards to the cost and quality of the books at Brigham Young University in United States. The findings revealed that students enjoyed utilizing open textbooks, valued the cheaper costs, and thought the texts were of good quality. In a similar study, Cuttler (2019) examined the perceived quality of open versus traditional textbooks by students in online and traditional classes. Participants were selected following a cross-sectional research design where 925 students were selected. These findings suggest that students who use open textbooks are nearly twice as likely to state they use the textbooks, use the textbook more often, and spend more time per week engaged with the textbook overall. Hilton & Laman (2012) also did a study about the utilization of an open psychology book in a college. The survey compared the learning outcome of 690 students in an introductory psychology class using open textbook with 370 students in a previous semester

using a traditional one. The study employed the use of a peer reviewed and pilot tested questionnaire. Several benefits were observed among the students who adopted the open textbook; higher class performances, fewer students withdrew from their classes than in the previous semester, and the final exam results of the department, according to the findings. In conclusion, these studies have afforded great evidence to argue that open textbooks are fairly more favorable among students and improves cost savings and engagement and accomplishment of academic performance in contrast to regular books. In addition, open textbooks are utilized more frequently and over longer intervals among students.

Relationship between students' awareness and utilization of open textbooks

Nyamwembe et al., (2018) explored students' knowledge and usage of OER in their studies in Kenya. It was established that OER awareness has a positive correlation with its usage among students when it comes to academic tasks. Also, Obinyan et.al. (2023) affirmed that students' awareness influence the utilization of OER in positive manner. Furthermore, Sawyerr-George et al. (2022) discovered a strong positive correlation of the students' awareness concerning open-access journals and their utilization metrics. These findings correspond with Manzo & Kannan's (2020) revelation showing that more student awareness resulted in increased they use of e-resources. These studies suggest the crucial role of students consciousness as to the correct approach and utilization of both OER and other e-resources at school. The observed positive relationship, emphasizes the importance of attempts to raise students' awareness concerning OER pointing to the fact that enlightened students are more likely to adopt OER into their learning endeavours.

Theoretical Framework

This research work is underpinned by Diffusion of Innovation Theory (DIT) which was proposed by Everett Rogers in 1962. The DIT can be used to support the use of open textbooks by LIS students. The DIT reflects on how an innovation is spread or disseminated in a particular social setting. To the context of open textbooks, the theory would help elucidate those factors that influence awareness and use of open textbooks among LIS undergraduate students at Delta State University.

Awareness of open textbooks: Going by the DTI, the awareness is a core element of any given adoption

process. As a result, the present study intended to determine the level of LIS undergraduates' awareness regarding the use of open textbooks. The theory claim that awareness can be modified or affected by such factors as communication channels as well as opinion leaders. For example, engaging key faculty and peers who advocate open textbooks to the LIS students can notify people better.

Utilization of open textbooks: According to the DIT, it is believed that factors influencing perceived attributes of an innovation does influence adoption and usage of the innovation. The research aimed at assessing the adoption of open textbooks by the LIS undergraduates. Through the lens of this theory, the benefits of open textbooks that affect their usage by the end-users are revealed. When LIS students discover that open textbooks are useful and better than conventional ones, they easy embrace them.

Relationship between awareness and utilization: This present research is aimed at establishing the link between awareness and use of open textbooks among LIS undergraduates. The DIT postulates that awareness is an essential, predisposing condition for adoption as well as utilization. However, as students become aware of the benefits and applicability of open textbooks, they are likely to embrace them. The theory also highlights the influence of communication channels, opinion leaders, and social value in generating awareness to foster adoption. As a result, if the relationship between awareness and utilization is strong, it implies that a higher level of awareness has positive effects on LIS undergraduates' usage of open textbooks.

The use of DIT involves determining how the observed advantages such as cost savings, portability, communication, and customization among others aid awareness creation and adoption rate of open textbooks by LIS undergraduates at Delta State University, Abraka Nigeria. It helps develop a theoretical framework to understand the diffusion of open textbooks as an innovation within the LIS student community and may serve for identifying strategies facilitating their adoption and use.

Methodology

The study used a survey descriptive research design. The target population was 477 undergraduate students, from which 220 participants were randomly chosen. The required sample size of the study was decided based on the Taro Yamane sample size formula. The instrument used to collect data was the questionnaire. The initial step involved distributing

220 questionnaires to respondents, and 217 responded, which were used for analysis. The instrument's reliability was confirmed with a Cronbach's alpha of 0.79. The coefficient achieved in the process made the developed questionnaire credible. Data were analyzed with frequency counts, simple percentages while SPSS version 29 was used to test the hypothesis at 0.05 level of significance. The questionnaire responses were evaluated using nominal and a 4-point Likert-type scale framework. The research questions 1 and 2 had a criterion score of 2.5 for evaluation. The criterion score was obtained as follows: Criterion score = $(4 + 3 + 2 + 1)/4 = 2.5$. The choice of a 2.5 criterion score on a 4-point Likert scale is significant in interpreting survey results, as it mathematically represents the midpoint between the lowest (1) and highest (4) values. This score provides a middle ground for respondents, allowing them to express a stance that is neither strongly negative nor strongly positive. While the scale itself does not include an explicit neutral option (as in a 5-point scale), the 2.5 score serves as a functional midpoint between disagreement and agreement, offering an intermediate response. For research questions 1 and 2, the mean scores below 2.5 were adjudged as low awareness and usage, and the scores of 2.5 and above were adjudged as high awareness and usage.

Results

Section A: Demographic Information

Table 1: Gender of the Respondents

Gender	Frequency	Percentage %
Male	57	26
Female	160	74
Total	217	100

Table 4: Level of Awareness of Open Textbooks

S/N	Awareness of Open Textbooks	SA	A	D	SD	Mean	S.D
1.	Open textbooks are very easy to access on the internet	74	117	23	3	3.2	0.68
2.	Open textbooks re textbooks licensed under an open copy-right license	52	147	18	-	3.1	0.55
3.	Open textbooks are freely available online to be used by students, teachers, and members of the public	67	114	30	6	3.1	0.74
4.	Open textbooks are a possible solution to high textbook prices	40	98	66	13	2.7	0.82
	Grand Mean					3.1	0.7

The finding in Table 1 suggests that females made up the majority of the respondents involved in the study.

Table 2: Age Range of the Respondents

Age Range	Frequency	Percentage (%)
21-30	150	69
31-40	51	24
41-50	16	7
Total	217	100

From Table 2, it was clear that 150(69%) of the respondents were found within the age of 21-30 years, 51 (24%) within the age of 31-40 years and 16 (7%) within the age of 41- 50 years. This means that most of the respondents were aged between 21-30 years.

Table 3: Year of Study of the Respondents

Year of study	Frequency	Percentage (%)
100	47	22
200	58	27
300	67	31
400	45	20
Total	217	100

In detail, 67(31%) of the students were in the 300 level, 58(27%) were in the 200 level 47(22%) and 45(20%) in the 100 and 400 levels respectively as shown in Table 3.

Research Question 1

What is the level of awareness of open textbooks by LIS undergraduates?

Table 4 therefore indicates that all the 4 items have mean values above the criterion mean (2.5). Furthermore, the grand mean 3.1 is more than the criterion mean of 2.5, which is an indication that the students are very much aware of the open textbooks. There is a generally high level of awareness as shown by the respondents on open textbooks, however, there may be some discrepancy in opinions especially towards perceiving an open textbook as a solution to book prices.

Research Question 2

What is the level of utilization of open textbooks by LIS undergraduates?

Table 5: Level of Utilization of Open Textbooks

S/N	Use of Open Textbooks	SA	A	D	SD	Mean	SD
1.	I use open textbooks for my research activities	72	140	5	-	3.3	0.51
2.	I use open textbooks to prepare my course work	60	144	13	-	3.2	0.53
3.	I use and freely share open textbooks with my friends to save cost	58	131	22	6	3.1	0.68
4.	The use of open textbooks serves as an alternative to expensive commercial print textbooks	48	140	23	6	3.0	0.66
Grand Mean						3.2	0.6

Table 5 therefore indicates that all the 4 items have mean values above the criterion mean (2.5). Furthermore, the grand mean 3.2 is more than the criterion mean of 2.5, which shows that the students have a high level utilization of open textbooks. Overall, respondents show a high level of utilization of open textbooks for various purposes, including research, coursework preparation, and cost-saving measures.

Hypothesis 1: There is no significant relationship between LIS undergraduate students' awareness and utilization of open textbooks

Table 6: Relationship between LIS undergraduate students' awareness and utilization of open textbooks

Variable	Mean	Standard Deviation	N	R	p-value	Remark
Awareness	12	2.3	217	0.806	0.000	Significant
Utilization	13	2.4				

The results demonstrate a strong positive connection through a correlation coefficient of 0.806 supported by a p-value of 0.000. Testing the hypothesis at the 0.05, the p-value is less than the alpha value of 0.05. Our analysis shows direct evidence of a relationship between these two variables because the p-value is below our significance threshold. LIS undergraduate students at Delta State University Abraka, show a meaningful connection between their knowledge of open textbooks and their actual usage of them.

The positive relationship indicates that the high level of awareness of open textbooks positively influence the level of use by undergraduate students in the study. Nevertheless, the study does not investigate deeper statistical relationships or primary drivers, leaving room for additional research. In addition, the study is restricted to LIS undergraduate students at Delta State university, Abraka. It is left for other researchers to determine whether the above mentioned correlation is true or not for LIS undergraduate students in other states in Nigeria. Future studies should be conducted, to increase validity and enhance generalization.

Discussion

The results show that undergraduate students majoring in LIS are highly aware of open textbooks. Such high awareness can be attributed to both the general popularity of open textbooks in education and a wide range of OER initiatives carried out within higher educational establishments throughout Nigeria. These initiatives aimed at popularizing the use of OER have successfully spread the word about the advantages stemming from the adoption of open textbooks, shaping awareness levels among LIS students. The Diffusion of Innovations Theory backs up these results as it claims that awareness is an essential aspect of the innovation process. Additionally, the study shows that undergraduate students in LIS are heavy users of open textbooks. This is due to cost-effectiveness and affordability of open textbooks as they address the financial limitations faced by most undergraduate students. Moreover, open textbooks mirroring LIS students' understanding of principles of free access and information emancipation allow for their frequent usage. The ubiquity of open textbooks online also contributes significantly to their popularity with students. Once more, such results coincide with the Diffusion of Innovations Theory; it is perceived benefits that stimulate the utilization of innovation. Lastly, the research established a substantive association between open textbook awareness and use among LIS undergraduate students. This means that with increasing awareness, students are more likely to use open textbooks. This result underlines the importance of awareness programs and open textbook implementation in academic surroundings. This information can be used by educational institutions and policymakers to promote the use of open textbooks among LIS undergraduate students. The results of this study align with the DIT, which emphasizes the role of awareness as a precursor to adoption and utilization. The findings of this research corroborate the Diffusion Innovations Theory, which highlights awareness as a prerequisite for adoption and utilization.

Conclusion and Recommendations

The findings indicate that LIS undergraduate students are highly aware and widely use open textbooks. The findings of a hypothesis test indicated that there was a significant association between awareness and use among LIS undergraduate students to open textbooks at Delta State University, Abraka. According to the results, it was recommended that open textbooks should be encouraged and supported

by university administrators as well as educators in the LIS department among undergraduate students. Furthermore, measures could be taken to improve the awareness campaigns such that new students are continually informed about open textbooks, their availability as well as benefits. Such campaigns should be championed by university administrators, library staff and faculty as they are in the best position to pass this information during orientation programs and throughout the students' university studies. In addition, it might be advantageous for the university to research ways on how open textbooks can take root in other departments or academic programs. This might include partnering with publishers, educators, and pertinent stakeholders in developing more open educational resources as part of curriculum.

Additionally, constant studies and evaluation of open textbooks efficacy in influencing performance levels among LIS undergraduate students may offer important information for future projects. This constantly updated assessment can serve as a means to measure the productivity of open textbooks in comparison with conventional textbooks and advice decision-making regarding resource material at the university. The findings of the hypothesis test shown an optimistic link between awareness and use of open textbooks by LIS undergraduate students; hence the researchers recommended continuous effort to encourage support as well as expanding use within university settings.

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