

# SELF-EFFICACY AND INTEREST OF BIOLOGY LECTURERS IN LEARNING MANAGEMENT SYSTEM (LMS) UTILIZATION: A STUDY OF NORTHEAST NIGERIAN UNIVERSITIES

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**ABSTRACT** The revolution in education is transforming the teaching and learning processes. This has been noticed in many studies. However, little was known about biology lecturers' efficacy and interest in this technological age to use LMS for teaching practices. Therefore, this study adopted a descriptive survey research design of cross-sectional type to examine the self-efficacy and interest of biology lecturers in LMS utilization in Northeast Nigerian universities. A purposive sampling technique was used to select the population of the study which was 398 biology lecturers in northeast public universities. Stratified random sampling was used to select the sample as determined using Yamane Taro Formula. A structured questionnaire was administered and a 92.96% response rate was achieved. The instrument underwent face and content validation by three experts—two from the Science Education Department and one from the Measurement and Evaluation Department at ATBU, Bauchi. The internal consistency of the instrument was tested using Cronbach alpha and 0.90 was obtained. The instrument was distributed to the respondents with the aid of trained research assistants. Data collected were analyzed using mean, standard deviation, and independent sample t-test. The study found that biology lecturers have high self-efficacy and interest in using the LMS for teaching biology concepts in Northeast universities, in Nigeria. However, no significant differences were found between male and female biology lecturers in their self-efficacy and interest in utilizing LMS in Northeast universities, in Nigeria. The study recommended that to foster the self-efficacy and interest of biology lecturers in utilizing LMS, adequate support such as professional development be provided.

**KEYWORDS:** LMS, Self-Efficacy, Interest, Biology Lecturers, Northeast University.

## I. INTRODUCTION

In Nigeria, the integration of LMS has been revolutionary in recent days coupled with the effects of the COVID-19 pandemic. It is one of the educational technology software used in many universities across the country. LMS is a medium through which computers and other technological devices are used to give students strength, motivation and new experience in gaining knowledge (Halim, Wahyuni, Malvina, & Yani, 2020; Hassan & Anas, 2022). Through LMS, lecturers would effectively link the theoretical information to real-world experience. It enables lecturers to teach efficiently and actively engage the students in developing a deep understanding of the subject matter. LMS is a platform that facilitates the delivery of course materials, knowledge sharing and communication among learners (Vermaat et al., 2016). The uses of LMS are to supplement the traditional lecture method with learning materials for students to review and do revision at their own time and place (Abdallah, Ahlan, & Abdullah, 2016). Lecturers can also use LMS to conduct assessments and track students' progress using online. Hassan and Anas (2022) commented that LMS can increase usage and improve the overall student experience. It provides virtual environments for the teaching and learning process. Based on previous studies, among the benefits of LMS are the sharing of knowledge and serving as a communication device (Goh, Hong, & Gunawan, 2013). Lecturers not only can use the LMS to share lecture notes and learning resources, but they can also promote collaboration and interactivity among themselves or students using online discussion, chat rooms and other features. Online discussion fosters the engagement of users and enables rich exchanges and community building (Ismail et al., 2013). This helps to create a more open atmosphere where both the teachers and students are expected to stay connected and keep engaged in class discussions. Students are given the chance to share what they learn with peers using discussion boards among others. Literature recommends that the prime

role of LMS is to communicate the intended learning activities to students and to act as a content repository for the creation and management of resources. It facilitates students' learning experiences via self-assessment quizzes and acts as a kind of online communication tool among lecturers and students. However, many studies confirmed the effectiveness of LMS in enhancing e-learning compared to traditional methods used in universities for various instruction (Halim et al., 2010; Ismail et al., 2013; Goh et al., 2019; Aliyu, 2018; Hassan & Anas, 2022). Despite extensive research on LMS effectiveness, limited studies have explored biology lecturers' self-efficacy and interest in using LMS for teaching particularly in Northeast Nigerian universities. Therefore, this study filled such a gap by examining the self-efficacy and interest of biology lecturers in utilizing LMS in Northeast universities, in Nigeria. Hence, the relevance of this study lies in its potential to enhance the quality of biology education in Nigerian universities by promoting the effective use of LMS. Understanding the interest of biology lecturers in using LMS becomes essential to foster a positive attitude towards technology-enhanced learning.

Studies have shown that lecturers' interest in using LMS is closely linked to their willingness to participate in professional development activities and their motivation to innovate teaching methods (Goh et al., 2019; Almasri, 2022). Harisu et al. (2023) researched Biology lecturers' readiness to use LMS for teaching in Northeast Nigerian public universities. The study adopted a survey design with 382 Biology lecturers. Stratified random sampling techniques were used to select six public universities, one from each state in the area of the study. A checklist titled Checklist for LMS Type (CLMST) and a questionnaire titled Biology Lecturers Readiness to use LMS for teaching (LBRLMS) were used as instruments for data collection. The findings revealed that biology lecturers were aware of LMS for instructional delivery, the LMS were available in public universities, biology lecturers had positive attitudes and skills toward the use of LMS for instructional delivery, and administrative support was sufficient. Similarly, Nuhu (2022) on the lecturers' awareness, readiness and attitude towards the utilization of LMS for instructional delivery in Colleges of Education in Niger State, Nigeria. It was revealed that lecturers are aware and ready to adopt LMS for teaching purposes. Furthermore, they possess a positive attitude towards the adoption of LMS for instructional delivery. Furthermore, Ibrahim & Andy (2018) investigated the level of utilization and challenges in using LMS (LMS) from the perspective of the lecturers and students in higher education institutions (HEI) in Maldives. The study was conducted using a multiple case study approach to compare the patterns and trends of the lecturer. This study has examined the utilization and challenges of LMS in the HEIs in Maldives by conducting a qualitative survey questionnaire with lecturers and students. In this study, three HEIs (HEI1, HEI2, and HEI3) which are currently using an LMS in Maldives were 30 lecturers selected to form the population of the study. It was found that the LMSs are utilized for passive communication and they are underutilized for meaningful collaborative teaching and learning. The identified key challenges are the lack of planning and strategies for the LMS implementation, the lack of user participation and training, the need for models to track and forecast the evolution of LMS, and the need to support the decisions regarding LMS implementation. The LMS is at the heart of every successful modern HEI. The failure to implement an effective LMS could affect the success of the HEIs. The HEIs have realized that the failures of the LMS are because of the underutilization, lack of planning and strategies, and lack of integration with other information systems.

Abdulaziz et al. (2018) investigated the Utilization of LMS and reviewed different features of commercially available and mostly utilized modern LMS systems including a comparative analysis. A case study focused on the universities of Saudi Arabia was also carried out. The study was a reviewed article on the utilization of LMS. The study focused on higher institutions that have implemented LMS in Saudi Arabia. The sample includes a diverse range of institutions in the region. Purposive sampling and stratified sampling techniques were employed. Questionnaires, interviews, and document analysis were used as methods of data collection in the study. Descriptive statistics, comparative analysis and thematic analysis were used to analyze the collected data. The study found that most of the universities (90%) in Saudi Arabia use Blackboard LMS for their teaching and learning activities. Every LMS has similar features for communication and management for a course, however, currently, there is no feature or tool available in any LMS to assist students or teachers to perform laboratory experiments in a distance learning platform. As laboratory experiments are essential for most engineering and science courses, a feature for virtual laboratories needs to be developed and implemented via these LMSs. On the lecturers' perceived ease of use and usefulness of LMS, Mustapha et al. (2024) investigated the Lecturers' Perception of the Integration and Utilization of LMS in Teaching Biology in North-East Universities, in Nigeria.

It was found that biology lecturers have a positive perception towards the integration of LMS for instructional delivery in northeast public universities and a significant difference was found between the mean score of male and female biology lecturers on their perception. Additionally, perceived ease of use and perceived usefulness of LMS were found positive and a significant difference was found between the male and female biology lecturers on their perceived ease of use. However, no significant difference was found between male and female biology lecturers on their perceived usefulness of LMS. Therefore, given this background, this study investigated the biology lecturers' self-efficacy and interest in using LMS for instructional delivery.

## II. RESEARCH METHODOLOGY

The study adopted a descriptive survey research design of cross-sectional type. The choice of this design agrees with the suggestion of Timothy (2019), who stated that a descriptive survey design method should be adopted when the study involves the use of a questionnaire to collect the opinions, views and perceptions of the respondents in a study. Similarly, Mwanti (2020) also opined that, in any study that seeks to sample the opinion of people on any subject matter, a survey research design should be used for such study. Based on their submission, the design was considered suitable and appropriate to examine the self-efficacy and interest of biology lecturers in utilizing LMS in Northeast universities, in Nigeria. North-east is one of the six geopolitical zones of Nigeria representing both a geographic, political, and educational region of the country. It comprises six states. The region has many higher institutions of learning with fifteen (15) of them being public universities. They are: Modibbo Adama University of Technology Yola, Adamawa State University Mubi, Abubakar Tafawa Balewa University Bauchi, Bauchi state university Gadau, Federal university of Medical science Azare, University of Maiduguri, Borno State University, Nigeria Army University Bui, Federal University Gashua, Yobe State University Damaturu, Gombe State University, Gombe State University of Science and Technology, Federal University Kashere, Taraba State University Jalingo, and Federal University Wukari. The study adopted purposive techniques to choose the population of the study, which consisted of 398 biology lecturers of which 92 were from Biology Education and 306 from biological science in sixteen public universities in Northeast Nigeria. The respondents of this study were 199 biology lecturers sampled from the population using a stratified random sampling method. This sample was determined using Yamane Taro's (1967) formula. A structured questionnaire using a four-point Likert scale was distributed to 199 biology lecturers. The questionnaire contained an introductory part that seek the consent of the respondents to participate in the study and the response rate was 92.96%. The instrument was face and content validated by three experts; two from the Science Education Department and one from the Measurement and Evaluation Department of Abubakar Tafawa Balewa University Bauchi. Their observations were used to develop the final copy of the instrument. The Cronbach alpha reliability coefficient for the instrument was 0.90. The instrument was distributed physically to the respondents with the aid of trained research assistants and was guided by the following research questions

- (a). To what extent do biology lecturers in Northeast Nigerian universities perceive their self-efficacy in utilizing LMS for instructional delivery?
- (b). What is the level of lecturers' interest in using LMS in teaching Biology in North-East Universities?

## RESEARCH HYPOTHESES

The following null hypotheses were tested at 0.05 alpha level of significance.

**H0<sub>1</sub>:** There is no significant difference between the mean rating values of male and female biology lecturers' self-efficacy on the perceived usefulness of LMS for instructional delivery in public universities in Northeast Nigeria.

**H0<sub>2</sub>:** There is no significant difference between the mean rating values of male and female biology lecturers' interest in the perceived usefulness of LMS for instructional delivery in public universities in Northeast Nigeria

Data collected were analyzed using descriptive and inferential statistics through the IBM Statistical Package for Social Sciences (IBM SPSS version 23.0).

## III. RESULTS AND DISCUSSION

**RESEARCH QUESTION 1:** what is the level of lecturers' self-efficacy on the utilization of lms in teaching biology in north-east universities?

The descriptive statistics in Table 1 reveal that biology lecturers in Northeast Nigeria universities exhibit high self-efficacy in utilizing LMS for instructional delivery. The mean scores for all the items ranged from 3.49 to 3.83, with a grand mean of 3.65, indicating strong agreement among the respondents. This suggests that biology lecturers demonstrate strong self-efficacy in LMS usage, particularly in navigating platform features and integrating them into teaching practices.

**Table 1:** Mean and Standard Deviation of Lecturer Self-Efficacy on LMS.

S/N	Statements	N	Mean	SD	Remarks
1	I feel confident in my ability to navigate and use LMS features effectively for teaching biology	185	3.72	1.18	Agreed
2	I am comfortable troubleshooting technical issues related to LMS usage	185	3.83	1.09	Agreed
3	I perceive that prior experience enhances my confidence in LMS utilization	185	3.68	1.13	Agreed
4	I feel capable of incorporating LMS tools effectively into my teaching practice	185	3.49	1.19	Agreed
5	I am confident in my ability to adapt to new LMS features and update	185	3.51	1.24	Agreed
6	I can facilitate online discussions and forums using the LMS	185	3.57	1.22	Agreed
7	I am confident in integrating external resources into the LMS	185	3.62	1.25	Agreed
8	I can manage and organize my biology courses using the LMS	185	3.67	1.21	Agreed
9	I can customize the LMS to meet my teaching needs	185	3.64	1.18	Agreed
10	I am confident in training others to use the LMS for teaching biology	185	3.82	1.02	Agreed
Grand Mean			3.65	1.17	High Self-efficacy

**RESEARCH QUESTION 2:** What is the level of lecturers' interest to use LMS in teaching Biology in North-East Universities?

Table 2 shows the descriptive statistics on the interest of biology lecturers in using LMS for instructional delivery. The Table shows that all the items had a mean ranged from 2.99 to 4.00, with a grand mean of 3.69 indicating a positive interest in using LMS for instructional delivery among the lecturers in Northeast public universities Nigeria. This suggests that lecturers are strongly interested in integrating LMS into their teaching practices and are motivated to explore its features for enhancing student learning experiences.

**TABLE 2:** Mean Values and Standard Deviation of Biology Lecturers' Interest in using LMS.

S/N	Statements	N	Mean	SD	Remarks
1	I am strongly interested in integrating LMS into teaching biology concepts	185	3.86	0.99	Agreed
2	I actively explore LMS features and seek ways to integrate them into my teaching biology practices	185	3.75	1.07	Agreed
3	I am curious about the potential benefits of LMS for enhancing students learning experiences	185	3.79	1.07	Agreed
4	Teaching biology concepts using LMS arouses my interest and that of the students.	185	2.99	1.42	Agreed

5	I find the idea of using LMS in teaching biology appealing	185	4.00	1.07	Agreed
6	I am interested to continue using the LMS in the future	185	3.82	0.93	Agreed
7	I am interested in participating in LMS-related professional development activities	185	3.74	0.92	Agreed
8	I am interested in recommending the use of LMS in teaching other subjects to my colleagues	184	3.69	0.96	Agreed
9	I am motivated to use the LMS to innovate my teaching methods	185	3.69	0.86	Agreed
10	I am interested in collaborating with other lecturers to improve LMS usage	185	3.59	1.13	Agreed
Grand Mean			3.69	1.04	Positive Interest

**Ho<sub>1</sub>:** There is no significant difference between the mean rating values of male and female biology lecturers' self-efficacy on the perceived usefulness of LMS for instructional delivery in public universities in Northeast Nigeria.

Table 3 shows that there was no significant difference in the mean score of male and female biology lecturers' self-efficacy towards the use of LMS in Northeast Nigerian public universities being compared ( $P=0.716$ ). The result displayed shows that there were very tiny differences in the mean score between male biology lecturers (Mean = 3.681, SD 0.997) and female biology lecturers (Mean = 3.630, SD = 0.902). Therefore, the null hypothesis is accepted, indicating no significant gender difference in self-efficacy.

**TABLE 3:** Independent Sample T-test Analysis of Mean Score Between Male and Female Biology Lecturers' Self-Efficacy on Usefulness of LMS for Instructional Delivery

Variables	N	Means	SD	T	DF	P	Remarks
Male	88	3.6818	0.99742	0.364	183	0.716	Not Significant
Female	97	3.6309	0.90212				

Not Significant at 0.05 alpha level.

**Ho<sub>2</sub>:** There is no significant difference between the mean rating values of male and female biology lecturers' interest in the perceived usefulness of LMS for instructional delivery in public universities in Northeast Nigeria.

Table 4 shows that there was no significant difference in the mean score of biology lecturers' interest in using LMS in Northeast Nigerian public universities being compared ( $P=0.730$ ). The result displayed shows that there were differences in the mean score between male biology lecturers (Mean = 3.712, SD 0.709) and female biology lecturers (Mean = 3.676, SD = 0.703). Therefore, the null hypothesis is accepted, indicating no significant gender differences in interest.

**TABLE 4:** Independent Sample t-test Analysis of Mean Score Between Male and Female Biology Lecturers' Interest on Usefulness of LMS for Instructional Delivery

Variables	N	Means	SD	T	DF	P	Remarks
Male	88	3.7125	0.70952	0.346	183	0.703	Not Significant
Female	97	3.6765	0.70302				

Not Significant at 0.05 alpha level.



## SUMMARY OF THE FINDINGS

- i. The biology lecturers' self-efficacy towards the use of LMS for instructional delivery was high and there is no significant difference between male and female biology lecturers in their perceived self-efficacy towards the use of LMS for instructional delivery.
- ii. Biology lecturers possessed an interest to use LMS for instructional delivery and there is no significant difference between male and female biology lecturers in their interest to use LMS for instructional delivery.

The finding of this study indicated that the biology lecturers' self-efficacy towards the use of LMS for instructional delivery was high. The strong demonstration of self-efficacy in LMS usage by biology lecturers in navigating its features and integrating them into teaching practice might be as a result that biology lecturers in Northeast universities are aware of LMS and ready to integrate it into their teaching activities. This result aligns with You and Deng (2022), who reported a rise in digital literacy among educators, suggesting that improved LMS access and training initiatives may have contributed to high self-efficacy scores. Also, Algarni (2024) content that modern LMS platforms are designed to be user-friendly, reducing the learning curve and making it easier for all lecturers to develop confidence in using this system. Supporting the finding of this study further was a study of Goh et al. (2019) who found that self-efficacy significantly influenced the adoption of LMS in higher education. Finding of this study in Table 2 shows that biology lecturers have a positive interest in the use of LMS for instructional delivery. In a simple term, biology lecturers have the required interest in using LMS for instructional delivery in public universities in Northeast Nigeria. This indicates that biology lecturers are strongly interested in integrating LMS into their teaching practices and are motivated to use its features to enhance student learning experiences. This is similar to the findings of Almasri (2022) and You and Deng (2022) who revealed in their respective studies that the increasing integration of digital tools in education and the user-friendliness of modern LMS, which has normalized the use of LMS across all demographics, leading to a general rise in interest among lecturers regardless of gender. To understand the gender differences among the self-efficacy of biology lecturers in utilizing LMS. The study found no significant difference in the mean rating score of male and female biology lecturers on their self-efficacy towards the use of LMS for instructional delivery. However, the finding of this contradicted that of Yu and Deng, (2022) and Algarni (2024) who in their respective studies found that gender differences in self-efficacy related to technology use, with male lecturers often higher. Similarly, no significant difference was found in the mean rating score of male and female biology lecturers on their interest in using LMS for instructional delivery. However, Yu and Deng (2022) and Almasri (2022) further distance from the finding of this study in their respective studies that male lecturers often show higher interest in technology-related tasks compared to their female counterparts, potentially due to differences in prior exposure and confidence levels.

## CONCLUSION

This study investigated biology lecturers' self-efficacy and interest in utilizing LMS in Northeast universities Nigerian. The self-efficacy and interest of biology lecturers were high and positive in utilizing LMS for teaching activities. Therefore, it was established that this high self-efficacy and positive interest of biology lecturers can only be sustained if they are supported and encouraged to utilize the LMS. This study has contributed meaningfully to the existing body of knowledge by focusing on self-efficacy and interest of lecturers which are critical psychological factors influencing the successful adoption of LMS. To enhance LMS adoption, universities should implement targeted professional development programs that support biology lecturers in integrating LMS tools into their teaching methodologies.

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