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LEVERAGING ON LEARNING MANAGEMENT SYSTEM RESOURCES FOR EFFECTIVE TEACHING AND LEARNING IN POST COVID ERA

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ABSTRACT

E-learning is not particularly new, however the conoravirus pandemic has made it mandatory that any institution that wants to stay afloat must think e-learning. LMS being an e-learning technology seeks to foster the teaching and learning process by making education accessible where classroom teaching is either not available or insufficient. This study therefore sought to determine how lecturers leverage on LMS for effective teaching and learning in post COVID era. Three research questions were raised and answered and six hypotheses tested at 0.05 level of significance. The study adopted a descriptive survey design. 121 lecturers from six higher institutions in Anambra participated in the study. Questionnaire was used as instrument for data collection while the analyses were done using mean and standard deviation for the research questions and t-test and ANOVA to test the hypotheses. The study found out among others that lecturers perceived LMS to be effective for teaching and learning but however did not utilize it in various aspect of teaching. Also age do not have significant effect on the perception of lecturers.

Keywords: Learning Management System, Leveraging, Effective teaching, Post COVID Era

Introduction

The world in the recent times had been threatened by the Coronavirus pandemic. This pandemic has brought a lot of ills on the world at large. Coronavirus disease, commonly called COVID-19 is an illness caused by a novel coronavirus named severe acute respiratory syndrome corona virus 2 (SARS-CoV-2) (Mishra, et al. 2020). It was first identified in Wuhan City, Hubei Province, China. It was initially reported to the World Health Organization (WHO) on December 31st, 2019 and was declared a global health emergency by WHO on January 30th, 2020, and later a global pandemic on 11th March 2020 (World Health Organization 2020b). The WHO outlined various ways to curb the spread of the dreaded disease. This includes, washing of hands with soap regularly, using hand sanitizer, wearing of face mask, maintaining social distancing, among others. Also schools, churches, businesses, industries and markets were shut down in many places as part of measures to stem the spread. These measures, no doubt, adversely affected the education sector as schools had to shut down for a long period of time, leaving many students stranded. Consequently, the government began to advocate and encourage schools to go into online and multimedia teaching and learning otherwise known as e-learning. E-learning is an advanced teaching-learning methodology that uses ICT (Information and Communication Technology) to interact and collaborate (Garg et al., 2020). Yakubu, et al. (2019) asserted that e-learning leverages on the internet to facilitate access to learning, curriculum and support pedagogies.

Learning management system (LMS) is one of the e-learning technologies that facilitate effective teaching and learning. LMSs are online learning technologies for the creation, management and delivery of course material (Sabharwal et al. 2018; Turnbull, et al. 2019). It is a software application or web-based technology used to plan, implement, and assess a specific learning process (Chigozie-Okwum, et al. 2018).

Reid (2019) averred that LMS has become the game changer for traditional teaching and learning. In the developed countries, even before the COVID-19 pandemic, institutions of higher learning had long adopted the use of LMS in their institutions. Conversely, developing countries have only put in little effort as non-governmental agencies support the use of LMS and other e-learning platforms (Mtebe, 2015). Albeit, the pandemic came and exposed the gross negligence of e-learning technologies by many developing countries (Chigozie-Okwum et al., 2018) and institutions of learning had to embrace the use of e-learning technologies like LMS since the institutions were shut down. Various governments and management of higher institutions made efforts to ensure that students do not truncate their studies by providing the necessary resources needed to implement e-learning. Resources were put in place for the use of e-learning technologies in teaching and learning such as LMS (Mishra, et al.; Rasmaitadila et al, 2020). UNESCO also in an effort to facilitate students' learning despite the pandemic recommended the use of LMS. It further listed some LMS which would serve the need of the time. For example: Moodle, Seesaw, Schoology, Google classroom, Skooler, CenturyTech, ClassDojo among others (UNESCO, 2020). The pandemic is not yet completely over as there are still cases of people having the disease even though life is gradually returning to normal with the discovery of the vaccine. However, given to the benefits accruing from the use of LMS and the highly advanced technological era in which we are, confining teaching and learning to only the traditional classroom experiences should be a history. The use of LMS in teaching and learning has become a new normal. Therefore, there is need to determine whether lecturers in Nigeria higher institutions are leveraging on LMS to ensure effective teaching and learning in post covid era. The study raised the following research questions:

1. What are the lecturers' perceptions of the learning management system?
2. How do lecturers utilize LMS resources in teaching and learning?
3. What are the factors affecting lecturers' commitment to LMS usage?

Hypotheses were also formulated.

1. Lecturers do not significantly differ in their mean ratings on perception of LMS based on gender.
2. Lecturers do not significantly differ in their mean ratings on usage of LMS as a result of gender.
3. Lecturers do not significantly differ in their mean ratings on factors affecting their commitment to LMS usage based on gender.
4. Lecturers do not significantly differ in their mean ratings on perception of LMS based on age.
5. Lecturers do not significantly differ in their mean ratings on the usage of LMS based on age.
6. Lecturers do not significantly differ in their mean ratings of factors affecting their commitment to LMS usage based on as a result of age.

Literature Review

There are many benefits associated with the use of LMS. They range from easy access to learning materials, ability to reach a larger number of students, ability to present instructions in various modes for various kinds of learners, cost effective and many others. Mishra et al. (2020) identified LMS as the most popular means of distance education in Mizoram University. LMS, according to Ryann (2009), is a software application for the administration, documentation, tracking, reporting, automation and delivery of educational courses, training programs, or learning and development programs. They are designed to identify training and learning gaps, utilizing analytical data and reporting. It facilitates online learning delivery and allows instructors to focus on designing meaningful pedagogical activities (Kattoua, et al. 2016). LMS supports a range of uses (like testing, communication, registration, and learner tracking) and provides platform to deliver training or lessons online to learners from any part of the world at any time whether in real time or through recorded sessions. Also students can access online learning material (courses, guides, quizzes, videos, among others) any time they want. LMS has various tools that enable the presentation of learning materials in various forms of multimedia such as audio, video and animations. Kulshrestha and Kant (2013) outlined some common features of any educational LMS to include: Content management, assessment and testing, curriculum planning, reports generation, communication and collaboration and classroom and college announcements. In the opinion of Sharma and Vatta (2013), an LMS that will be suitable for educational institutions should be able to perform these services: (i) centralized and automate administration, (ii) self-service and guided services, (iii) Speed in assembling and delivery of learning content, (iv) Integrated training initiatives on a web platform, (v) Support for portability and standards (vi) Content personalization and knowledge reusability feature.

The learning management system concept emerged from e-learning in the late 1990s but currently make up the largest segment of the learning system market in the world (Davis, et al. 2009). Reid (2019) opined that LMS is the game changer for traditional teaching and learning. LMS is a special type of information systems focused on teaching and learning (Wang et al., 2007). It has introduced a new lift to online or distance education especially since the Covid era where face to face meeting is considered unsafe and as a measure to curtail the spread of the virus. Lecturers and instructors all over the world are canvassing the use of e-learning as opposed to the traditional classroom teaching. LMS is an e-learning technology popular for its e-delivery medium within institutions (Smith & Rupp, 2004). Chigozie-Okwum, et al. (2018) further identified the commonest LMSs as Blackboard, webCT, and Moodle applications. Moreover, there are many other LMS applications such as Canvas, Edmodo, NEO, desire2learn, recampus, schoology and others. An LMS is made up of two parts: an admin interface (where the organization of the learning program takes place like creating, managing, delivering courses, adding learners, analyzing reports, automating notifications etc) and a user interface (this is where the learner learns). It could be classified as: Cloud- based LMS vs self-hosted LMS vs private LMS or Open source vs Software as a Service (SaaS). The use of LMS in teaching and learning is not new but the recognition by UNESCO highlighted its usefulness in education. However, there are factors that affect its usage. They include: performance expectancy, perceived ease of use, behavioural intentions, social influence, attitude,

technical knowledge, curriculum design, lecturers' pedagogical skill and stability of power and internet services (Nicholas-Omoregbe et al., 2017; Yakubu & Dasuki, 2019; and Mishra, et al., 2020). Previous research showed diverse perception of lecturers towards LMS. Gow, Hong and Gunawan (2014) found that lecturers had negative perception towards the adoption of LMS in teaching in terms of ease of use and usefulness and needed more time to familiarize with the tool. Tarhini, et al. (2014); Fleming, et al. (2017) and Tinmaz & Lee (2020), also revealed that gender and age do not have significant effect on lecturers' perception, usage and commitment to usage. Ugwuoke, et al. (2019) in their study found that lecturers perceive LMS to be effective in teaching and learning and therefore utilized it in teaching. However, with the covid-19 pandemic and subsequent recommendation by UNESCO, it will be of import to determine the current perception of lecturers towards LMS.

Theoretical Framework

The theory underpinning this study is the technology acceptance model (TAM). TAM was developed by Fred Davis and Richard Bagozzi. TAM is a theory from the Information Systems (IS) discipline for explaining, predicting, and improving user acceptance of information technology (IT) (Davis, 1989). TAM uses two technology acceptance measures- perceived ease of use and perceived usefulness to explain why people will accept a particular technology. TAM tries to explain the relationship between peoples' beliefs system (perceived usefulness and perceived ease of use) and their attitude, intentions and actual use. TAM proposes that the perceived usefulness and perceived ease of use are predictors of user's attitude towards the system, behavioral intentions to use and actual usage (Moakoflin et al. 2019). According to Davis (1989), perceived usefulness refers to the degree to which a potential user believes that using the system would enhance his or her work performance. The author also explained that perceived ease of use means the degree to which a person believes that using a particular system would be free from effort, that is, how effortless a user believes using the technology will be. Attitude towards using entails a potential user's positive or negative feeling associated with performing a specific behavior. Behavioral intention to use refers to the degree to which a potential user has formulated conscious plans to perform or not perform some specified future behaviour. The perception of lecturers on the usefulness and ease of use of LMS will determine their attitude and actual use. Deducing from this theory, the Covid-19 pandemic has exposed the usefulness of LMS and with the various efforts put in by higher institutions to ensure hinge-free implementation of online education, it may be said that lecturers should not find it difficult using this technology.

Research Method

The study adopted descriptive survey design. The participants of the study were 121 lecturers randomly selected from five tertiary institutions in Anambra State, Nigeria. 58 lecturers were male representing 47.9% while 63 were female representing 52.1%. Also their age range were 20-39, 44 lecturers (36.4%), 40-59, 52 lecturers (43.0%) and 60-79, 25 lecturers (20.7%). A structured questionnaire was used to collect data for the study. The instrument was tested for reliability using Cronbach alpha method and the coefficients were 0.86, 0.80 and 0.78 for the various clusters. It was also subjected to validations by experts in measurement and evaluation. The instrument comprised of two sections: one section was used to elicit demographic data while the second section

contained items used to answer the research questions. Data collected were analyzed using the arithmetic mean and standard deviation for the research questions, while t-test and ANOVA were used to test the hypotheses at 0.05 level of significance.

Presentation of Results

Research Question 1

What are the lecturers' perceptions of the learning management system?

Table 1: Mean responses on the perceptions of LMS resources by lecturers in tertiary institutions in Anambra state.

S/N	Items	Mean	Std. Deviation	Remarks
1	LMS makes teaching and learning process easier	4.28	0.70	Agreed
2	LMS can be used to upload and sort learning materials	4.10	0.61	Agreed
3	It stimulates collaborative interaction in learning	4.01	0.80	Agreed
4	LMS facilitates assignment submission	4.07	0.69	Agreed
5	LMS aids grading and course evaluations	4.08	0.75	Agreed
Cluster	**Mean**	**4.11**		**Agreed**

The item by item analysis in Table 1 shows that all the items achieved mean scores ranging from 4.08 to 4.28, while the standard deviation scores show figures from 0.61 to 0.80. The cluster mean score of 4.11 indicates that on the whole, lecturers in tertiary institutions perceived LMS resources as very useful necessary to achieve greater efficiency in teaching and learning especially in the post COVID-19 era. The standard deviations showed homogeneity of the respondents.

Research question 2: How do lecturers utilize LMS resources in teaching and learning?

Table 2: Mean responses on the usage of LMS resources by lecturers in tertiary institutions in Anambra state.

S/N	Items	Mean	Std. Deviation	Remarks
6	I utilize LMS for uploading assignments	2.46	1.05	Disagreed
7	I teach students in computer laboratory	2.31	0.95	Disagreed
8	I review lectures and receive feedback using LMS	2.18	0.81	Disagreed
9	With LMS, learning materials are available to students before lectures	2.32	1.07	Disagreed
10	I discuss with students with the aid of LMS	2.16	1.05	Disagreed
11	I utilize LMS as an online storage	2.27	1.16	Disagreed
12	I utilize LMS for document sharing	2.21	1.23	Disagreed
Cluster	**Mean**	**2.27**		Disagreed

The item by item analysis in Table 2 show that all the items achieved mean scores ranging from 2.18 to 2.46, while the standard deviation scores show figures from 0.81 to 1.23. The cluster means score of 2.27 indicates that on the whole, most lecturers in tertiary institutions, despite

their LMS perceptions, they fail to utilize the resources in teaching and learning. The standard deviations showed homogeneity of their responses.

Research question 3: What are the factors affecting lecturers' commitment to LMS usage?

Table 3: Mean responses on the factors affecting lecturers' commitment to LMS resources.

S/N	Items	Mean	Std. Deviation	Remarks
13	Perceived usefulness	3.93	0.77	Agreed
14	Perceived ease of use	4.10	0.82	Agreed
15	Behavioural Intentions to use technology	4.00	0.87	Agreed
16	Technical knowledge	4.08	0.65	Agreed
17	Curriculum Design	3.74	0.90	Agreed
18	Stability of internet services	3.83	1.03	Agreed
19	Inefficient delivery of practical courses	3.86	0.91	Agreed
20	Lecturers' pedagogical skills	3.98	0.91	Agreed
Cluster	**Mean**	**3.94**		**Agreed**

The item by item analysis in Table 3 show that all the items achieved mean scores ranging from 3.73 to 4.09, while the standard deviation scores show figures from 0.65 to 1.03. The cluster mean score of 3.94 shows that lecturers in tertiary institutions will naturally be committed to integrating LMS resources in teaching and learning when they have the knowledge of its usefulness. The standard deviations showed homogeneity of the respondents.

Test of Hypotheses

Hypothesis 1: Lecturers do not significantly differ in their perception of LMS based on gender.

Table 4: The t-test summary of the difference between the mean ratings of lecturers on their perception of LMS resources as a result of gender.

Gender	N	X	SD	t-cal	p-val	A	df	Remark
Male	58	4.18	0.37	.825	.411	0.05	119	Not significant
Female	63	4.12	0.44					

Data in Table 5 show that the P-value of .411, is greater than the alpha level of 0.05 at 119 degree of freedom. The result indicates that male lecturers in tertiary institutions in Anambra State, with a mean score of 4.18, and female lecturers with a mean score of 4.12 do not differ on their perception of LMS resources. The null hypothesis is therefore accepted. So, lecturers do not significantly differ in their perception of LMS resources in tertiary institutions in Anambra state as a result of gender.

Hypothesis 2: Lecturers do not significantly differ on their usage of LMS as a result of age.

Table 6: The t-test summary of the difference between the mean ratings of lecturers on their LMS usage based on gender.

Gender	N	X	SD	t-cal	p-val	α	df	Remark
Male	58	2.19	0.63					
				1.10	.233	0.05	119	Not significant
Female	63	2.36	0.88					

Data in Table 6 show that the P-value of .233, is greater than the alpha level of 0.05 at 119 degree of freedom. The result indicates that male lecturers in tertiary institutions in Anambra State, with a mean score of 2.19, and female lecturers with a mean score of 2.36 do not differ on their usage of LMS resources. The null hypothesis is accepted. So, lecturers do not significantly differ in their extent of uasge of LMS resources in tertiary institutions in Anambra state based on gender.

Hypothesis 3: Lecturers do not significantly differ in their mean ratings of factors affecting their commitment to LMS usage based on gender.

Table 7: The t-test summary of the difference between the mean ratings of lecturers on factors affecting their commitment to usage of LMS resources as a result of gender.

Gender	N	X	SD	t-cal	p-val	α	df	Remark
Male	58	3.92	0.45					
				.520	.604	0.05	119	Not significant
Female	63	3.96	0.35					

Data in Table 7 show that the P-value of 0.604, is greater than the alpha level of 0.05 at 119 degree of freedom. The result indicates that male lecturers in tertiary institutions in Anambra State, with a mean score of 3.92, and female lecturers with a mean score of 3.96 do not differ on their commitment to LMS usage. The null hypothesis is accepted. Therefore, lecturers do not significantly differ in their extent of uasge of LMS resources in tertiary institutions in Anambra as a result of gender.

Hypothesis 4: Lecturers do not significantly differ in their mean ratings on perception of LMS based on age.

Table 8: Analysis of variance on the mean ratings of lecturers on their perception of LMS resources as a result of age.

Sources of variance	SS	Df	MS	F	P-value	Remark
Between Groups	1.09	2	.546			
				3.35	.038	Not Sig.
Within groups	19.21	118	.163			

Data in Table 8 show the test of difference between the mean ratings of lecturers on their perception of LMS resources, based on age. The test yields a F-value of 3.35 and P-value of .038. Since the P-value of the test is less than the alpha level of 0.05, the null hypothesis is accepted;

implying that lecturers do not significantly differ in their mean ratings on perception of LMS resources based on age. The derivation from this, is that lecturers' perception of LMS resources is not affected by age.

Hypothesis 5: Lecturers do not significantly differ in their mean ratings on usage of LMS based on age.

Table 9: Analysis of variance on the mean ratings of lecturers on their usage of LMS resources based on age.

Sources of variance	SS	Df	MS	F	P-value	Remark
Between Groups	.379	2	.189	3.12	.733	Significant
Within groups	71.75	118	.608			

Data in Table 9 show the test of difference between the mean ratings of lecturers on their usage of LMS resources, as a result of age. The test yields a F-value of 3.12 and P-value of .733. Since the P-value of the test is greater than the alpha level of 0.05, the null hypothesis is implies that lecturers significantly differ in their mean ratings on their usage of LMS resources based on age. The derivation from this is that lecturers' LMS resources usage is affected by their age.

Hypothesis 6: Lecturers do not significantly differ in their mean ratings of factors affecting their commitment to LMS usage based on as a result of age.

Table 10: Analysis of variance on the mean ratings of lecturers on factors affecting lecturers' commitment to LMS resources as a result of age.

Sources of variance	SS	Df	MS	F	P-value	Remark
Between Groups	.784	2	.392	2.50	.087	Significance
Within Groups	18.53	118	.157			

Data in Table 10 show the test of difference between the mean ratings of factors affecting lecturers' commitment to LMS resources usage, as a result of age. The test yields an F-value of 2.50 and P-value of 0.87. Since the P-value of the test is greater than the alpha level of 0.05, the null hypothesis is rejected; implying that lecturers significantly differ in their mean ratings on the factors affecting their usage of LMS resources based on age. It can be deduced, therefore, that lecturers differ significantly on the factors affecting their commitment to LMS resources usage as a result of ages.

Discussions of the Findings

Findings of the study revealed that lecturers perceived LMS resources as very useful to achieve greater efficiency in teaching and learning especially in the post COVID-19 era. This corroborates the views of Kattoua et al. (2016) that LMS facilitates online learning delivery and allows instructors to focus on designing meaningful pedagogical activities. The

authors noted that LMSs were designed to identify training and learning gaps, utilizing analytical data and reporting. Similarly, Dasuki and Quaye (2019) asserted that e-learning leverages on the internet to facilitate access to learning, curriculum and support pedagogies, while positing that LMS is one of the e-learning technologies that facilitate effective teaching and learning. However, Gow, et al. (2014) found that lecturers had negative perception towards the adoption of LMS in teaching in terms of ease of use and usefulness, and needed more time to familiarize with the tool.

The study also revealed that most lecturers in tertiary institutions, despite their LMS perceptions, fail to utilise the reources in teaching and learning. This could be as a result of lack of requisite skills and availability of LMS reources. The perception of lecturers on the usefulness and ease of use of LMS will determine their attitude and actual use. LMS supports a range of uses (like testing, communication, registration, and learner tracking) and provides platform to deliver training or lessons online to learners from any part of the world at any time whether in real time or through recorded sessions. Ugwuoke et al. (2019), albeit, in their study, found that lecturers perceive LMS to be effective in teaching and learning and therefore utilized it in teaching.

The findings of the study further revealed that lecturers in tertiary institutions will be committed to integrating LMS resources in teaching and learning when they have the knowledge of its usefulness. Put slightly different, lecturers' perceived usefulness and ease, technical knowledge, curriculum design, lecturers' pedagogical skills, among others, are factors affecting lecturers' commitment to LMS resources usage in tertiary institutions in Anambra state. This finding is in tandem with Moakoflin et al. (2019) study, which found that the perceived usefulness and perceived ease of use are predictors of user's attitude towards the system, behavioral intentions to use and actual usage. Therefore, the perception of lecturers on the usefulness and ease of use of LMS will determine their commitment to usage.

Generally under the hypothesis testing, the result of hypotheses revealed that gender has no significant difference in the lecturers' LMS resources perception, utilisation and commitment in tertiary institutions in Anambra State. Similarly, hypothesis 4 shows that lecturers do not differ significantly on their perception of LMS resources based on age. Conversely, the result of hypothesis 5 and 6 also showed that age significantly affect lecturers' usage and factors affecting their commitment to usage of LMS resources.

The findings of the hypotheses above are in tanden with the study of Tarhini, et al. (2014); Fleming, et al. (2017) and Tinmaz & Lee (2020), who found out differently that gender and age do not have significant effect on lecturers' perception, usage and commitment to usage.

Conclusion

Based on the findings of the study, it is concluded that lecturers in tertiary institutions in Anambra State have strong perception of LMS resources as effective pedagogy in teaching and learning. However, lecturers have low level of LMS utilisation notwithstanding their level of perception. Finally, lecturers' commitment to the usage of LMS resources is dependent on their perceived usefulness, easier usage, curriculum design, technical knowledge, among others.

Recommendations

Based on the findings, the following recommendations are made:

1. Management of tertiary institutions should

urgently provide LMS resources to facilitate lecturers' usage of such resources in teaching and learning, especially in this post COVID-19 era.

2. Lecturers in tertiary institutions in Anambra State should undergo training and retraining to improve their technical knowledge of LMS resources.

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