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Assessment of E-Learning Resources and Effectiveness of Learning Among Students of The Federal Polytechnic, Ilaro, Nigeria

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Abstract

This study assesses the growing adoption of web portals and ICT-enabled resources and their impacts on the effectiveness of learning among students of the Federal Polytechnic, Ilaro, Nigeria. Three (3) research questions were formulated and an online survey of 715 students was conducted across all disciplines and levels in the Institution. The study employed descriptive and inferential statistics (Percentage and linear Regression) for the analysis of data collected through a 4-point Likert type structured questionnaire administered among the students. The results indicate high availability of learning resources, remarkable access to the e-learning resources of the Polytechnic and a low satisfaction of students on the availability of real-time interaction and lecture videos. The results also reveal that e-portal use has a significant relationship with learning effectiveness and positive contribution to the effectiveness of learning among the students. It was recommended among others that an e-learning portal should be made to cater for students' preferences and higher educational institutions should complement the classroom lectures with e-learning so that the achievement of learning goals could be more enhanced.

Keywords: E-learning, E-learning Resources, Learning effectiveness, Web portal

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1. Introduction

Trends in technological diffusion ignite evolving changes in every facet of human learning as digital distortion engenders drastic transformation in both the teaching and learning processes and methods. These trends in technology adoption and its capacity to drive organisational activities, through ICT and related technologies are the vogue in most organisations of developed and developing nations. The education sector remains an important industry saddled with significant responsibility in the development of a nation. Many ICT induced changes that are seen in the running and management of higher education especially universities, polytechnics, colleges etc. are more important in the way staff interact, participate in the administration of their schools and how students access institutional facilities and receive quality learning. As a result of the different emerging trends in the use of technologies, tertiary education institutions now embrace the use of ICT to perform their core functions of teaching, research and learning as well as rendering services (Jayanetti, 2014). The development and use of telecommunication tools created huge possibilities to adopt information and communication devices for teaching and learning at different levels of education (Nnaekwe & Ugwu, 2019). With the potential of ICT in transforming teaching and learning processes (Simin, Thanusha, Logeswary & Annreetha, 2016), the adoption of ICT-enabled resources for teaching, learning and research is gaining wide attention (Omotunde, Babalola, & Omotunde, 2014), hence the unprecedented drive by institutions of higher education to integrate the use of ICT in most educational activities.

The global outbreak of the Covid-19 pandemic and its attendant challenges toward the end of 2019 through 2020 propelled and compelled many educational institutions to embrace the adoption of e-learning as a means to keep alive the academic and scholastic enthusiasm in students. According to Fan, Radford & Fabian (2017), the

use of e-portal for learning purpose makes higher education use a modern paradigm of technology-enabled content delivery and places emphasis on methods that enable lecturers to collaborate and allow an exchange of knowledge between lecturers and students to meet educational goals.

E-learning methods are of different types and the classifications are based on different factors. It can be described based on connectivity and functionality. Connectivity emphasizes that the learning process takes place via connectivity on the intranet, internet or the web of connectivity, implying that learning is delivered or received basically via the internet, intranets or the web. Based on Functionality, it allows electronic storage of information for teaching instructions, prompt update, easy retrieval and distribution of same to the students, all of which are made possible over the internet with the use of a computer (Vaibhav, et al, 2012). According to Algahtani (2011), e-learning is classified into computer-based and internet-based. Computer-based e-learning involves the use of a range of devices and software or the use of computers in place of the traditional method as an additional resource within and outside the classroom. The internet-based e-learning could be synchronous or asynchronous. In synchronous learning, the teacher and the students interact through a specific online resource which allows everything to take place in real-time. These include live-streaming of lectures and instructions, live chatting, video conferencing and teleconferencing. With the synchronous timing, there is alternate online access among instructors and learners (Algahtani, 2011). Asynchronous learning happens on schedule. The course instructor provides notes for reading and videos for viewing, gives assignments for the students to complete and exams for evaluation (Algahtani, 2011 & The Best Schools (TBS), 2018). This mode also allows learners to discuss with the instructors or teachers as well as among themselves over the internet at different times (Almosa & Almubarak, 2005). Strategies for asynchronous web-based learning incorporate planned video real-time, virtual libraries, address notes and exercise modules just as gathering conversations via web-based media platforms (TBS, 2018). The internet-based or internet-enabled e-learning is the focus of the present studies.

The deployment of information and communication resources and tools in education has given birth to a new mode of learning which does not necessarily require the physical presence of participants; hence, making learning goals easily achievable not only in a classroom environment (Gholamhosseini, 2008). The adoption of such teaching and learning modes capable of achieving qualitative and much-desired learning should be the focus of contemporary educational institutions (Zare, Sarikhani, Salari & Mansouri, 2016). The development and expanding significance of varied advanced innovations for teaching and learning in higher education has prompted web-based learning through applications and resources like the web, mixed media tools, electronic mail, etc. (Muslim & Ahmad, 2018).

E-learning is the utilization of ICT innovations in wide-range approaches of educations to support and facilitate learning in institutions of higher learning. This includes the deployment of ICT apparatuses in addition to customary classroom learning, internet-enabled learning or blending the two modes (Muthuchamy & Thiyagu, 2011; Organization for Economic Co-operation and Development, 2005). To Zare et al (2016), e-learning entails the use of electronic systems - computer, internet and multimedia resources, virtual magazines and newscasts, etc. to achieve faster, easier and better teaching and learn at reduced cost and time. Guragain (2016) posit that e-learning is a significant change from traditional classroom teaching and learning to ICT-based customized and flexible learning methods.

According to Imran & Malik (2017), the term e-learning covers the use of different kind of information and communication technologies (ICT) and electronic devices in education. According to them, with web-based learning, learners from remote places can communicate easily, knowledge could be acquired and shared among the learners, there are possibilities of open discussion and students can learn according to their schedule. All these facilities offer opportunities and abilities that cannot be utilised in conventional learning. This shows that e-learning is a form of learning in which electronic technologies are utilized to access curriculum content delivery outside a traditional classroom setting. It involves the use of information and communication technologies to enable and facilitate access to learning and teaching (Muthuchamy & Thiyagu, 2011; Arkorful & Abaidoo, 2014) and the delivery of courses happen specifically via a form of connectivity to somewhere other than the classroom.

E-learning offers the advantage to enable students in higher institutions to acquire education and also pursue other personal objectives and maintain their careers, thereby overcoming the rigid schedule of classroom setting (Borstorff & Lowe, 2007). With e-learning, consideration is given to cost, content delivery, service satisfaction, quality and speed (Liaw & Huang, 2003). With e-learning, the restriction of time and place is eradicated whereas interactivity among students and teachers is enhanced (Holmes & Gardner, 2006) and learning objectives can easily be achieved within a short time and with little efforts from both the learners and the lecturers (Rabah, 2005). It is a mode of learning that offers teachers several ways of interacting with their students and gives room for instantaneous feedback (Brown, Cromby & Standen, 2001).

According to Arkorful and Abaidoo (2014), e-learning is revolutionary and is mostly centred on the learner as well as its design involving a system that is interactive, repetitious, self-paced, and customizable. Hence, the design and the accessibility to the institutional web portal or e-learning portal is significant in achieving the e-learning objectives. In Nigeria, educational institutions are investing heavily in the creation of e-portals to take advantage of the possibilities offered by e-portals technology (Omotunde, Babalola, & Omotunde, 2014) and to provide quality educational services (Mohamed, James & Sayed, 2011). An e-learning portal is a website that offers users and organisations enhanced access to a wide range of learning resources from diverse sources. It may also include a rating system, search functionality, bookmarking ability, and more (Imran & Malik, 2017).

Higher education organisations in developed countries are passionately using e-portal as a necessary means to facilitate communication and service delivery between administrative staff, faculty members and most importantly the students. The rapid growth in internet applications like web portals particularly has led to various efforts in research with the aim of understanding service satisfaction on the internet. A portal looks more like a normal web when it has a wide range of sophisticated resources such as blogs, e-mails, search functions, news and directories (Muslim & Ahmad, 2018).

According to Sharma (2019), the five major components of an e-learning portal that are crucial for a thriving online learning environment are (i) *the audience/users* (the students who are the audience, their expectations, learning abilities and capacities to access and view materials, and their preferences and needs), (ii) *course structure* (course structure is an important factor in how learners will learn. This includes the organisation of course content, module development, length of materials, use of illustrations and pictures, to achieves learning goals), (iii) *Web Page Design* (navigation should be easy, appearance should be friendly, balanced use of text and graphics, visual style, pop-ups, formatting and filters should be simple. These can affect the learning experience of the learners), (iv) *Content Engagement* (Learning experience will be improved when exercises and class activities are included in the learning process, hyperlinks are provided for additional concepts, and explanations. The content should incorporate quizzes and tests, and skill assessment exercises should focus only on the course objective) and (v) *Usability* (Ease of use depicts the effectiveness of e-learning contents and resources. All links should work as intended, graphics should be clear and visible and the course objectives should be achievable and learners' expectations are met).

According to Li (2015), an electronic learning platform should provide easy access for learners to navigate through the content, be flexible, make content discoverable, allow for personalised learning activities, ensure both synchronise and asynchronised learning and be accessible from all forms of compatible devices.

The present study looks at the adoption of a web portal for e-learning and the implication of e-portal use on the effectiveness of learning in a higher educational institution with particular reference to the Federal Polytechnic, Ilaro. The discovery of the corona virus and its subsequent pronouncement as a global pandemic by the World Health Organisation forced governments, organisations, commercial and business entities, educational institutions, government agencies/parastatals to be on lockdown to avert the consequence of the spread of the virus. This necessitated the Nigerian government to direct institutions of higher education to embark on e-learning to minimize the effect of redundancy among the teeming youths in Nigerian higher educational institutions.

With the government's directive, the Federal Polytechnic, Ilaro swiftly redesigned its web content and features to cover a wide range of features and resources for e-learning in addition to already existing ones and commenced the e-learning for all levels of students. Hence,

The objective of this study was to assess e-learning resources, their level of use and effectiveness on learning among students of the Federal Polytechnic Ilaro from students' perspective and to determine the extent to which the portal content, usability and feature facilitate e-learning activities and outcomes. In line with the objective of the study, the research question raised is to find out the extent to which the use of e-learning resources contributes to the effectiveness of learning among students of the Federal Polytechnic Ilaro.

2. Methodology

An online survey was conducted among students of the Federal Polytechnic, Ilaro. The survey took place from July 18 to July 22, 2020, during which schools were under lockdown and students of the Institution were making use of the e-portal for learning. The study adopted the snowballing approach and the students were requested to participate in the survey through messages on electronic and social media platforms being used by the respective classes and groups of the students. A four-point Likert rating scale was developed as an instrument of data collection with the following rating Highly Available (HA) 4, Available (A) 3, Fairly Available (2) and Not Available NA (1). The questionnaire consists of four sections to collect demographic information, identify the learning facilities on the e-portal, assess the level of use and accessibility of the e-learning portal and determine the extent of effectiveness of learning via the e-portal respectively. All the five faculties/schools in the Institution were covered in the survey. These are the School of Communication and Information Technology (SCIT), School of Engineering (SE), School of Environmental Studies (SES), School of Management Studies (SMS) and School of Pure and Applied Sciences (SPAS). In all, a total of 715 students participated in the survey. Descriptive and inferential methods of data analysis were applied and the analysis was done using Statistical Package for Social Sciences (SPSS) version 23.

To have a quantitative analysis of students' assessment of the effectiveness of e-learning resources of the Federal Polytechnic, Ilaro for learning, the following hypothesis was formulated:

- E-learning resources do not have any significant impact on the effectiveness of learning among students of the Federal Polytechnic, Ilaro.

3. Results

Table 1: KMO and Bartlett's Test[a]

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.972
Bartlett's Test of Sphericity	Approx. Chi-Square	9712.992
	Df	190
	Sig.	.000

a. Based on correlations

The associated Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy Bartlett's Test of Sphericity reveals a correlation value of .972 and a significant probability value of 0.00 ($p<0.05$).

Table 2: Demography of Participants

A total of 715 students of the Federal Polytechnic, Ilaro participated in the survey out of which 309 were male and 406 were female as depicted in Fig. 1

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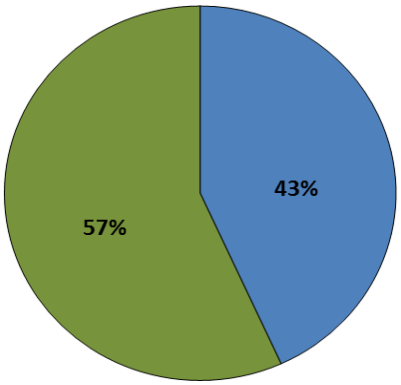

Fig 1: Gender of Respondents

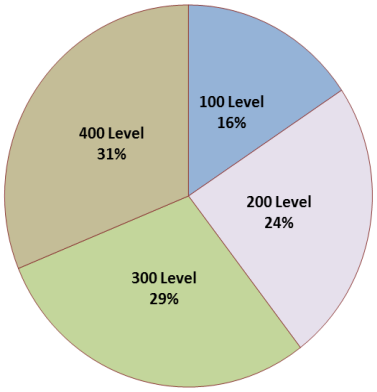

Fig 2: Level of Students

The distribution of participants in the survey cut across the different levels of students in the Institution. As indicated in Fig. 2, 16% of the students who participated in the survey were in 100 Level, 24% were in the 2nd year of their programme while 29% and 31 % were in 300 and 400 levels respectively. This shows that the different levels of students were represented in the survey.

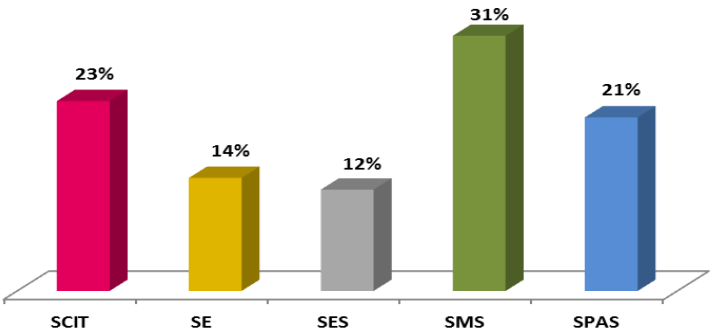

Fig 3: Faculty/School of Participants

Fig. 3 shows the coverage of the survey in terms of the faculty of the participants. The larger percentage of the respondents were from the School of Management Studies (SMS = 31%), School of Communication and Information Technology (SCIT = 23%) and School of Pure and Applied Sciences (SPAS = 21%). The School of Engineering (SE) and School of Environmental Studies SES) had 14% and 12% of the total participants respectively.

Table 2 depicts the level of accessibility to e-learning resources

Table 2: Learning materials/resources available on the e-learning management System

		Frequency	Percent	Valid Percent	Cumulative Percent
Course Modules and Course Content Information	NA	14	2.0	2.0	2.0
	FA	146	20.4	20.4	22.4
	A	379	53.0	53.0	75.4
	HA	176	24.6	24.6	100.0
	Total	715	100.0	100.0	

Lecture Notes	NA	21	2.9	2.9	2.9
	FA	149	20.8	20.8	23.8
	A	382	53.4	53.4	77.2
	HA	163	22.8	22.8	100.0
	Total	715	100.0	100.0	
Lecture Videos/Video Links	NA	340	47.6	47.6	47.6
	FA	159	22.2	22.2	69.8
	A	166	23.2	23.2	93.0
	HA	50	7.0	7.0	100.0
	Total	715	100.0	100.0	
Live chat and Real-Time Interaction With Course Lecture	NA	262	36.6	36.6	36.6
	FA	181	25.3	25.3	62.0
	A	201	28.1	28.1	90.1
	HA	71	9.9	9.9	100.0
	Total	715	100.0	100.0	

From the results, course modules and content information were indicated to be remarkably available on the e-learning portal (HA = 24%; A = 53%) indicating that learners are readily provided with course modules and good description of the content of their courses. The result also reveals the availability of lecture notes (HA = 22.8%; A = 53.4%; FA = 22%), Lecture videos and video links (HA = 7%; A = 23%) and Live chart and real-time interaction with course lecturers (HA = 9%; A = 28%; FA =25%).

Data on the access to e-learning resources on the e-learning portal reveals that course information and lecture notes are adequately available and easily accessible to the students. The participants showed availability of course modules containing detailed information including lecture notes to facilitate learning on each of the courses. However, the participants indicated low availability of lecture videos and real-time interactions with course lectures or instructors to enhance their learning on the portal. This is an indication of the level of satisfaction of the students with the availability of real-time interaction and supported lecture videos to facilitate learning.

Tabe 3 is the correlation matrix between E-learning Resource (ER) and Learning Effectiveness (LE)

Table 3: Correlations Matrix

		LE	ER
Pearson Correlation	EL	1.000	.828
	ER	.828	1.000
Sig. (1-tailed)	EL	.	.000
	ER	.000	.
N	EL	715	715
	ER	715	715

ER and LE correlates at .823 which is a high positive correlation. This denotes that the factors tested (e-portal use and effectiveness of learning) has a high positive relationship with each other.

Table 5: ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	10176.984	1	10176.984	1557.944	.000[b]
	Residual	4657.542	713	6.532		
	Total	14834.526	714			

a. Dependent Variable: LE
b. Predictors: (Constant), ER

Table 5 shows the level of significance of the relationship between ER and LE [f (1/713) = 1557.9, P<0.05]. Hence, the null hypothesis is rejected at a 0.05 level of significance and the alternative hypothesis is accepted at a 95% confidence interval. Thus, it is upheld that e-portal use has a significant impact on the effectiveness of learning among students of the Federal Polytechnic, Ilaro.

Table 6: Correlation coefficient

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.846	.500		5.687	.000
	ER	.567	.014	.828	39.471	.000

The correlation coefficient in Table 6 shows a Beta value of .567 with an associated significant value of 0.00 < p,0.05. This implies that a unit increase in ER will trigger a 56% increase in LE. From the above table, the regression equation is written as Y=2.846+.567X. This signifies that any unit change in the independent variable will yield a 56% increase in the dependent variable, that is, any increase in the use of the e-portal will lead to about a 56% increase in learning effectiveness.

4. Discussion

The results portend a significant use and accessibility to the e-learning resources of the Institution and the learning resources were reported to be available with a notable inadequacy of lecture video and real-time interactions among learners and course lecturers. The student signified that the content of the e-learning resource is user-friendly, easy to use and access. This result points to remarkable ease of use and access. This negates the findings of Omotunde, Babalola and Omotunde (2014) in which a large percentage of the students reported their institutional web portal to be complex and navigation was cumbersome. The result of the present study shows that e-portal use has a significant relationship with learning effectiveness and this conforms to the findings of Imran & Malik (2017). The factor inputs show considerable use of the portal for e-learning, with an easy-to-use interface, easy accessibility, navigation, easy-to-use content arrangement and format of lecture materials which are considered essential for an e-learning portal as posited by Arkorful and Abaidoo (2014), Li (2015) and Sharma (2019). The result clearly shows that the e-learning portal facilitates effective learning among the students, enhances students'' academic engagement and contributes to learning goals.

5. Conclusion

The study examines the use of e-learning resources of the Federal Polytechnic Ilaro from students' perspective and the extent to which it facilitates effective learning activities and outcome. The e-learning resource was found to have features that capture the need and purposes of the students while certain features like real-time interaction and lecture videos or video links resources were under-utilised on the portal. The development and adoption of the e-learning resources were found to have a significant positive contribution to the effectiveness of learning among the students, it facilitates academic engagement of the students, lends a sense of purposeful use and has a remarkable positive impact on learning goals.

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