Assessment of Mobile Learning as Management Strategy in Post Corona Virus Era for Economics Education Methodology in the 21st Century in Imo State Secondary Schools

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Abstract

The researcher investigated assessment of mobile learning as management strategy in post corona virus era for economics education methodology in the 21st century in Imo State secondary schools. The study adopted a survey design. The population of the study consists of 30240 (296 economics teachers and 29944 economics students) from 278 public secondary schools in Imo State. (SEMB, 2021). The sample for this study is made up of 212 (36 economics teachers and 176 economics students) from the entire population, using multi stage random sampling technique and disproportionate random sampling technique. The researcher utilized a self-constructed ordinal rating scale as the research instrument for collection of data. The rating scale is titled "Assessment of Mobile Learning as Management Strategy in Post Covid Era for Economics Teachers and Students Scale (AMLMSPCEETSS)". This instrument for the study had ten items using the four-point Likert type scale. The content and face validity of the instrument used was carried out by three specialists, one specialist from the field of Educational Measurement and Evaluation, one specialist from Education technology and a specialist from Educational Management and Planning. Cronbach alpha statistics was used to determine the reliability of the instrument with an index of 0.84. Mean score and standard deviation were used to answer the research questions. The hypotheses were tested using independent sample Z-test at a $p < 0.05$ level of significance. The results of the study showed that there is no significant difference between the mean rating of Economics teachers and Students on the on the level of usage of mobile learning in secondary schools in Imo State. Based on the findings, it was recommended among others that teachers and students should be sponsored to attend regular online conferences, seminars and workshops especially on areas of computer training so as to become ICT compliant, and possibly use the skill more regularly in the mobile teaching and learning sessions.

Keywords: Management, strategy, mobile, learning, COVID-19, economics.

Introduction

The recent outbreak of the Coronavirus (COVID 19) pandemic increased the gaps in the education sector globally. Though, the COVID-19 pandemic is novel, but it already has noxious effects on humanity. COVID-19 outbreak has created educational disruptions, and global health concerns that proved very difficult to manage by global health systems. As at now, no nation or race across the world is immune from the COVID-19 pandemic, and the entire world seems overwhelmed by the speed of the spread and the devastating effects of

COVID-19. The COVID-19 pandemic has no boundaries, and the effect is large and fast. Just within few months of the outbreak of the disease, it has drastically changed the lifestyles of the entire world with billions of people being forced to 'stay at home', 'observe self-isolations', and work and learn from home. It has limited the freedom of people to move, trade or associate. Not only has COVID-19 caused a total lockdown in many countries across the world and Nigeria, but it also created a worrisome concern on the way forward for the educational system in the country. The COVID-19 pandemic affected educational systems worldwide, leading to the widespread closures of schools (Wikipedia, 2020b). It created serious disruptions in academic activities, as well as in career plans. As part of the global efforts to combat COVID-19, many countries across the world closed down schools in an attempt to contain the c COVID-19 pandemic. According to the United Nations Educational, Scientific and Cultural Organization (UNESCO) monitoring, over 100 countries implemented nationwide closures, impacting over half of the world's student population (UNESCO, 2020a).

The gradual ease of the lockdown of schools in Imo State do not make up for the gap of the effect of the corona virus pandemic. The COVID 19 guidelines do not permit for cluster of students in a class but the increasing numbers in secondary school classes in Nigeria do not permit for full compliance of this guideline, thereby affecting the mass return of students back to the classroom. However, with the negative impact of this virus on the state of the education system in the country, there is a need to adopt a more technological approach to meet up with the demand of teaching and learning, which is prevalence in the western countries.

The traditional face to face teaching is said to be the most common teaching strategy used in secondary schools, where the teachers and students come together to a defined point, which is the classroom in a structured school environment to facilitate teaching and learning. This method of teaching is said to be easier as the teacher has access to the students and can interact with the students' case when there is need to. This is no longer possible as the students are at home due to the outbreak of the virus. The global world has taken a quick response to the way forward to curb the effect of education shutdown; this is the use of technological approach to teaching and learning. Mobile learning is one of the management strategies that is now used to replace the conventional way of learning. Over the last few decades, there has been a development in the wireless and mobile technologies which has greatly fostered this new kind of learning, mobile learning. Various scholars have tried to have a universal definition of Mobile learning or M-Learning. However, there is no one fixed explanation of the term M-Learning as it can be manipulated in different ways to fit the situation under which it is being used. There have been similar definitions of the term with some saying that it is a form of e-learning through the use of mobile phones. (Zawaideh, 2017).

Mobile learning or M-Learning has been viewed from both the pedagogical perspective as well as the technological perspective. This is because there are scholars who defines M-Learning as any learning activity that goes on when the learner is not at some fixed position or learning activity that a student is subjected to while at the present of the mobile technology. M-Learning has also been defined as any process that gives the learner the

opportunity to be more interactive when interacting with, applying or creating information through some digital portable device that one has easy access to and carries it in most of the places that he/she goes to. From the explanations, it is clear that M-Learning is a new form of e-learning that is offered to the students through the application of mobile technologies. With the use of mobile learning as a management strategy for teaching and learning, students can learn from their respective home even if the global lockdown continues. Teachers are to prepare the techniques to be used to facilitate the lesson. The teacher who is the manager schedules the time and hour to hold the class and the students are expected to join the class from their homes with the use of their mobile device and portable gadgets.

Mobile learning as a management strategy also include the management of the entire strategic approach which involves the planning, organization and funding of the process as well as the management of students' attitude towards the use of this technological approach in order to yield a productive outcome in the entire teaching and learning process. One of the advantages of mobile learning as a management strategy is the ability to provide access to learning contents out of the course time. Mobile learning management systems might be used to provide this. Additionally, mobile learning contents are produced based on design principles for qualified interactions. Researchers suggest that the duration of access time should be increased (Çelik, 2012). Moreover, determining and reporting duration and number of visit session in the mobile learning system are important (Martin & Ertzberger, 2013). At the same time, various technical regulations are proposed for effective learning through mobile learning such as rapid and wireless internet network infrastructure, big screen size and mobile applications in the native language of students, so that students will not be exposed to extraneous cognitive load (Anderson, Franklin, Yinger, Sun, & Geist, 2013; Ozan, 2013; Royle, Stager & Traxler, 2014;). Being distractive, challenges in use and technical issues are seen as problems that have to be solved in mobile learning (Gikas & Grant, 2013). There are implications and recommendations for implementation in mobile learning research. There are various researches that mobile learning increased academic achievement (Oberer & Erkollar, 2013). Ozan (2013) came with a conclusion that mobile learning is more permanent for learning. In addition, using social networks and mobile technologies positively affect students' performance toward courses. Evans (2008) emphasized that mobile learning is more effective and instructive than books, and more supportive of learning. Mobile learning offers benefits such as quick access to information for students, diverse ways of learning, contextual learning, control over own learning, supporting and encouraging learning, increased participation in the course, will to use in the course and positive meaningful differences of academic achievement, considering the results of the researches.

The students' use of digital and mobile media during lessons are related to the teachers' confidence level in their digital competences (Bocconi, Kampylis & Punie, 2013). Inevitably, students are affected by the teachers' stance toward technologies in education. The students' motivation for learning may also be correlated to the access and availability of innovative learning resources, including mobile games in school environments (Sardone & Devlin-Scherer, 2010). The European Union (2013) has underlined the importance of high access to information and communication technology infrastructure at school; as its survey reported that between 20-25% of European students are taught by digitally competent

teachers who have high access to information and communication technology. Academic evidence also shows that increasing professional development opportunities for teachers is an efficient way of boosting technology acceptance in teaching and learning, since it helps build highly confident and supportive teachers (Sampson, Isaias, Ifenthaler, & Spector, (2012); Sharples, Arnedillo-Sánchez, Milrad, & Vavoula, (2009).

In Beutner, and Pechuel, (2018) argued that mobile learning for STEM education also integrates concepts that are usually taught as separate subjects and emphasizes the application of knowledge to real-life scenarios. A lesson or unit in a STEM class is commonly based on finding a solution to a real-world problem and tends to highlight project-based learning, which mobile learning pose the solution for covid-19 global pandemic in the educational system. A variation of STEM is STEAM, which includes an 'A' for art and design. Artistic design is becoming an essential part of STEM education since creativity is an integral part of innovation. Many STEM lessons involve building models and simulated situations. A good STEM lesson ensures that students understand the connection to the real world. STEM Education prepares students for life, regardless of the profession they choose to follow. For instance, STEM training teaches students how to approach a problem, come up with a solution, and experiment for it. These skills could be applied to a wide range of scenarios: running a business, designing a website, running a political campaign, or creating alternative approach to teaching and learning policy. Teaching students how to think for themselves and giving them a framework and process for doing so empowers them to do much more. "m-Learning is the acquisition of any knowledge and skill through using mobile technology, anywhere, anytime, that results in an alteration in behaviour". (Beutner, and Pechuel, 2018)

Mobile learning, as a novel educational management approach, encourages flexibility with time as a strategy for use; students do not need to be of specific age, gender, or member of a specific group or geography, to participate in learning opportunities. Restrictions of time, space and place have been lifted. Mobile technologies enable these economics students to become more adaptable to flexible and contextual lifelong learning, a situation defined by Aderinoye, Ojokheta, and Olojede, (2007) as the "knowledge and skills" people need to prosper throughout their lifetime. Clearly, these activities are not confined to specified times and places; however, they are very difficult to achieve through traditional education channels. Put simply, mobile technologies fulfill the basic requirements needed to support contextual, life-long learning by virtue of its being highly portable, unobtrusive, and adaptable to the context of learning and the learners' evolving skills and knowledge (Aderinoye, Ojokheta, and Olojede, (2007)

Mobile learning strategy assists students to create social interaction. It promotes collaborative learning, interactivity and instant feedback as well as collaboration between peers. It improves the students' knowledge structure; their learning achievements and motivation (Mouza and Barrett-Greenly, 2015). Domingo and Garganté (2016) further point out that students are more willing to engage when learning with mobile technology; their desire to accomplish educational tasks also increases with the use of mobile technology and it helps learners to become more self-directed in their learning. Mobile communication in education is a solution with a selection of prospects and challenges (Kommers and Hooreman, 2009). M-Learning applications have various educational benefits: they can be

used as study aids; can be accessed from almost anywhere; and with the aid of location capabilities, students can use location-based information (Cheon 2012). Mobile technology applications supplement higher education by extending traditional educational platforms and encouraging distance learning or using settings outside of the classroom (Al-Emran, 2016). Content applications that make use of personalized instruction can facilitate academic growth and self-efficacy among students (Mouza and Barrett-Greenly, 2015).

With a variety of tools and resources available, m-Learning provides increased opportunities for the personalization of learning for both students and teachers and allows educators to move away from traditional lecture method. Students also become more engaged in their own learning journey and are more active participants in their own learning. M-Learning allows learners to personalize their learning based on their characteristics and preferences, as well as the tools and applications available to them without time and space limitations (Brown, & Mbati, 2015). The learner thus builds and develops his/her own choice of educational activity through the use of web-based applications and social media to create personal and authentic communities of learning. Sampson and Karagiannidis (2002) characterize personal learning environments as one-to-one or many-to-one learning contexts (i.e. one or many tutors for one learner); learning independent of time, space and location; and learning designed around learners' characteristics. When m-Learning can also contribute to students' career orientations. When reviewing progress reports through the years the student may realize that he is performing better on practical based tasks and decide to follow a vocational school. It is crucial for the development of students to ensure their place in the globally competitive economy.

The result of a study conducted by Fotis and Chris, (2017) on mobile application for regulated self-assessment shows an improvement in the performance of students who actively engaged with the use of mobile learning system. The t-test of the study showed that the student had an average of 63% before the application of mobile learning (t-value=2.56677 at $p < .05$). where the post-test averages score was 68.24%. Zawaideh, (2017) study revealed that utilization of mobile devices enhances students' motivation. This directly implies that there is a direct and a substantial correlation between utilization of mobile devices and learner's motivation towards learning. Blanka, (2019) study indicates that foreign language learning via mobile learning devices, particularly studying and revising English vocabulary, is effective in the enhancement of university students' performance.

It seems clear that throughout the world the temporary cessation of the face-to face activities of secondary education has been a huge disruptor of their functioning. The impact of this disruption is highly variable and depends, firstly, on their ability to remain active in their academic activities and secondly, on their financial sustainability. The efforts made to continue teaching courses in virtual mode have been notable everywhere and given the lack of experience with similar situations in the past; the transfer has not been easy. Secondary education also may or may not have sufficiently mature virtual education systems and even in the best case scenario, it is difficult to think that they can be scaled-up to the necessary dimensions without the intervention of external technical supports such as video servers. In short, it is one thing to have the necessary technological and technical infrastructure to support virtual courses for a relatively significant percentage of secondary education students.

It is quite another, much different, to provide the technical and technological needs for economics classroom and for all students. While m-learning offers more opportunities, the rapid growth of wireless infrastructure throughout Nigeria and Imo State provides mobile connectivity to more people each year. Even in rural settings, the majority of wireless connectivity is still in the low bandwidth of GSM and basic GPRS bands. This means that while mobile learners do have access to voice and data, low bandwidth restricts the use of resource-rich materials such as video-clips, audio and video streaming, and downloading large files.

It is worrisome that in most Nigeria secondary schools in this present digital age, occasioned by the outbreak of the COVID 19 pandemic era, many secondary school students are idle at home. Attempts by few secondary schools to introduce m-learning was not quite successful because m-learning has not been formally incorporated into our secondary school system as a management strategy for student/teacher interaction for learning. There exists the gap of uncovered areas in the scheme of work for most secondary school subjects including Economics. Adequate planning, financial implication and organization should be part of the plan for maximization of m-learning in our secondary schools and for effective teaching and learning of the STEM including Economics in the post COVID 19 era.). In most of the secondary schools, teachers and students use their mobile devices for social interaction without taking advantage of the educational benefit which the usage of device can influence positively on students' study habit. However, in educational context, students are heterogeneous in terms of aptitudes, prerequisite knowledge, motivation, experience and learning styles. One begins to wonder if the Economics teachers use varieties of mobile gadgets to teach the students and what are the challenges facing its usage?

Aims and Objectives
The aim of this study is to undertake an assessment of mobile learning as management strategy in post COVID era for teaching economics in Imo State secondary schools. Specifically, the study is to achieve the following:
1. Ascertain the usage of mobile learning by Economics Education teachers and students
2. Find out the challenges faced by economics teachers and students in the use of mobile learning digital instrument and accessories.

Research Questions
The following research questions were posed by the researcher in line with the purpose of the study
1. What is the usage of mobile learning digital instrument by Economics education teachers and students?
2. What are the challenges faced by economics teachers and students in the use of mobile learning digital instrument and accessories?

Hypotheses

The following hypotheses are formulated and tested at 5% error level.

1. **Ho_1:** There is no significant difference between the mean ratings of economics education teachers and economics students on the usage of mobile learning in Imo State?

2. **Ho_2:** There is no significant difference between the mean ratings of economics education teachers and economics students on the challenges faced by economics teachers and students in the use of mobile learning?

Method

The study adopted a survey design. The population of the study consists of 30240 (296 economics teachers and 29944 economics students) from 278 public secondary schools in Imo State. (SEMB, 2021). The sample for this study is made up of 212 (36 economics teachers and 176 economics students) from the entire population, using multi stage random sampling technique and disproportionate random sampling technique. The researcher utilized a self-constructed ordinal rating scale as the research instrument for collection of data. The rating scale is titled "Assessment of Mobile Learning as Management Strategy in Post COVID Era for Economics Teachers and Students Scale (AMLMSPCEETSS)". This instrument for the study had ten items using the four-point Likert type scale. The content and face validity of the instrument used was carried out by three specialists, one specialist from the field of Educational Measurement and Evaluation, one specialist from Education technology and a specialist from Educational Management and Planning. Cronbach alpha statistics was used to determine the reliability of the instrument. Mean score and standard deviation was used to answer the research questions. The hypotheses will be tested using independent sample Z-test at a $p < 0.05$ level of significance.

Results

Research Question One

What is the level of usage of mobile learning by Economics teachers and students?

Table 1: Mean scores of Economics Teachers and Students on the level of usage of mobile learning by Economics teachers and students

Table 2: Mean scores of Economics teachers and Students on the usage of mobile learning by Economics teachers and students?

S/N	Item Statement	Teachers n=36			Students n=176		
		$\bar{x}$	SD	Decision	$\bar{x}$	SD	Decision
1	My interaction/use of M-Learning is understandable and clear	2.16	1.05	Disagree	1.78	1.11	Disagree
2	I use M-Learning to get educational resources to boost my productivity such as quick accessibility of information	1.55	.90	Disagree	1.67	.91	Disagree
3	M-Learning is constructive in my day to day academic life	3.18	1.13	Agree	3.00	1.22	Agree
4	I utilize M-Learning to finish up my academic asks more quickly	2.16	1.19	Disagree	2.19	1.26	Disagree
5	I utilize M-Learning so in order to accomplish things that are so meaningful to me	1.70	.99	Disagree	1.61	1.09	Disagree
	Mean of Means	**2.15**			**2.05**		

The result in table 1 shows the mean scores of economics teachers and students on the usage of mobile learning in secondary schools in Imo State. the analysis shows that only items 3 is agreed by the economics teachers and students since the mean scores recorded by the items were above the criterion mean of 2.50. But items 1, 2, 4 and 5 had mean scores below the criterion mean of 2.50 and were thus not agreed by the respondents. the mean of means are 2.15 and 2.05 for economics teachers and students respectively, an indication that the respondents see m-learning as constructive in their day to day academic life, but fail to use my interaction with m-learning is understandable and clear, use m-learning to get educational resources to boost my productivity such as quick accessibility of information, utilizing m-learning to finish up my academic asks more quickly and utilizing m-learning so in order to accomplish things that are so meaningful to me.

Hypothesis 1

There is no significant difference between the mean ratings of economics teachers and economics students on usage of mobile learning in secondary schools in Imo State?

Table 2; Means standard deviation and z-test of different between the mean rating of economics teachers and economics students on the level of usage of mobile learning in secondary schools in Imo State.

Status	Number	DF	Mean	SD	Z-Cal	Z-Critical	Decision
Teachers	36		10.75	5.26			
Students	176	210	10.25	5.93	±0.898	±1.960	H_0: Accepted

Table 2 shows the Z-test analysis of difference between the mean ratings of economics teachers and economics students on the level of usage of mobile learning in secondary schools in Imo State. The mean score and standard deviation of the 36 teachers 10.75 and 5.26 respectively while the mean score and standard deviation of the 176 students are 10.25 and 5.93 respectively. With a degree of freedom of 210 and the Z-test statistics application, it revealed that Z- calculated is 0.60 while Z- tabulated is 1.96. Since the Z-calculated is less than the Z-tabulated, it shows that the null hypothesis is not rejected. The conclusion is that there is no significant difference between the mean rating of Economics teachers and Students on the level of usage of mobile learning in secondary schools in Imo State.

Research Question Two

What are the challenges faced by economics teachers and students in the use of mobile learning digital instrument and accessories??

Table 3: Mean scores of Economics Teachers and Students on the challenges faced by economics teachers and students in the use of mobile learning

S/N	Item Statement	Teachers' n=36			Students' n=176		
		$\bar{X}$	SD	Decision	$\bar{X}$	SD	Decision
1	Connectivity Costs and Data Costs	3.00	1.12	Agree	2.56	1.15	Agree
2	Smart Device Ownership	3.14	1.07	Agree	2.76	1.18	Agree
3	Software Enabling Seamless Ubiquitous Learning	3.22	.90	Agree	3.12	.86	Agree
4	Digital Literacy	3.08	1.13	Agree	3.11	1.11	Agree
5	Bring Your Own Device (BYOD) and Associated Technical Support	2.81	1.33	Agree	2.51	1.41	Agree
	Mean of Means	**3.10**			**2.81**		

The result in table 3 shows the mean scores of economics teachers and students on the challenges faced in the use of mobile learning in secondary schools in Imo State. The analysis shows that all items in the cluster are agreed by the economics teachers and students since the

mean scores recorded by the items were above the criterion mean of 2.50. The mean of means is 3.10 and 2.81 for economics teachers and students respectively, an indication that the respondents agreed that the challenges faced in using are connectivity costs and data costs, smart device ownership, software enabling seamless ubiquitous learning, digital literacy and bring your own device (BYOD) and associated technical support.

Hypothesis 2

There is no significant difference between the mean ratings of economics teachers and economics students on the challenges faced by economics teachers and students in the use of mobile learning?

Table 4; Means standard deviation and z-test of different between the mean ratings of economics teachers and economics students on the challenges faced by economics teachers and students in the use of mobile learning.

Status	Number	DF	Mean	SD	Z-Cal	Z-Critical	Decision
Teachers	36		15.51	5.55			
Students	176	210	14.06	5.71	±0.759	±1.960	H_0: Accepted

Table 4 shows the Z-test analysis of difference between the mean ratings of economics teachers and economics students on the challenges faced in the use of mobile learning in secondary schools in Imo State. The mean score and standard deviation of the 36 teachers 15.51 and 5.55 respectively while the mean score and standard deviation of the 176 students are 14.06 and 5.71 respectively. With a degree of freedom of 210 and the Z-test statistics application, it revealed that Z- calculated is 0.60 while Z- tabulated is 1.96. Since the Z-calculated is less than the Z-tabulated, it shows that the null hypothesis is not rejected. The conclusion is that there is no significant difference between the mean ratings of economics teachers and economics students on the challenges faced in the use of mobile learning in secondary schools in Imo State.

Results

The findings of the study revealed that m-learning use is constructive in the day to day academic life of teachers and students, but fail to use my interaction with m-learning is understandable and clear, use m-learning to get educational resources to boost my productivity such as quick accessibility of information, utilizing m-learning to finish up my academic asks more quickly and utilizing m-learning so in order to accomplish things that are so meaningful to me and that there is no significant difference between the mean rating of Economics teachers and Students on the level of usage of mobile learning in secondary schools in Imo State. Bitok (2014) found that teachers were averagely prepared in terms of ICT knowledge skills but lacked experience in the use for more advanced teaching class such as blended learning and mobile learning. Adimora, Onah, Akaneme, Akubuilo, Eya and Umeano (2014) revealed that majority of the teachers and students do not have access to ICT facilities, some of the teachers and students are not prepared to use ICT facilities in teaching. The usage of mobile learning affects positive teaching and learning.

Finally, the findings of the research question revealed that the challenges faced by economics teachers and students in the use of mobile learning are connectivity costs and data costs, smart device ownership, software enabling seamless ubiquitous learning, digital literacy and bring your own device (BYOD) and associated technical support. The hypothesis shows that there is no significant difference between the mean ratings of economics teachers and economics students on the challenges faced in the use of mobile learning in secondary schools in Imo State. This finding supports Brown, and Mbati, (2015) that Digital literacy of both learners and educators remains a challenge. In fact, many learners are in recent days more digital literate than most educators, especially when it comes to mobile technologies and social media. Barker(2014). To mitigate some of these challenges, institutions may opt for choosing your own device out of approved devices, or corporate owned personally-enabled devices. Odongo (2010) agreed that service providers across the world, but especially in Africa, have expensive rates for data for prepaid clients. The cost of Internet access in low-income countries (many of which are in Africa), relative to income, is 150 times the cost of a comparable service in a high-income country.

Conclusion

Mobile learning as management strategy is an innovative idea if both the teachers and students have adequate knowledge of the use ICT gadgets, especially as the learning environment in this COVID-19 era will be based through the use of mobile device gadgets. Mobile learning strategy have the ability to address the gap created by the global lockdown and will also improve students efficiency as teaching and learning plays through the STEM education.

Recommendations

The following recommendations were made

1. Teachers and students should be sponsored to attend regular online conferences, seminars and workshops especially on areas of computer training so as to become ICT compliant, and possibly use the skill more regularly in the mobile teaching and learning sessions.
2. The Government need to do more in the provision of power/electricity infrastructure in their tertiary institutions, also subsidize the cost of smartphones and internet access for students and teachers, to facilitate m-learning.

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