Biology Pre-Service Teachers' Awareness and Readiness Towards the use Virtual Learning Platforms in Tertiary Institutions an Implication for Instructional Approaches in Stem

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Abstract

This study investigated the Biology Pre-Service Teachers' Awareness and Readiness Towards the Use Virtual Learning Platforms in Tertiary Institutions an Implication for Instructional Approaches in Stem.The research adopted was a descriptive survey research design. The population of this study comprised of all One Hundred and Fifty (150) pre-serviced biology teachers from two tertiary Institutions (Ibrahim Badamasi Babangida University, Lapai and Federal University of Technology Minna, Niger state).Questionnaire titled 'Assessment of pre-service biology teachers awareness and readiness towards the use virtual learning platforms in Tertiary Institutions of Niger State.' was used for data collection on a four modified rating scale. Reliability of the instrument was determined Using Cronbach-alpha, the result computed generated a reliability index 0.76.The data collected were analyzed using Mean and Standard deviation to analyze the stated Research QuestionsThe study on assessment of pre-service biology teachers' awareness and readiness towards the use virtual learning platforms in Tertiary Institutions of Niger State concluded that most of the pre-service teachers have low awareness on virtual learning platforms. The pre-service teachers should increase their participation in trainings of virtual learning platforms and the pre-service teachers should always be ready to use virtual platforms to teach in the classroom.
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Introduction

The role of Information and Communication Technology (ICT) to the development of any nation in recent times cannot be over emphasized. ICT has brought significant changes to all aspects of human social-economic activity in which the educational sector is not left out. Notable changes often occur as technology advances, with the inception of the electronic learning paradigm, there have been improvements in the qualities of teaching, of learning, accessibility, and efficiency in higher education through access to resources, services, remote exchanges and collaborations. Electronic learning whose acronym is e-learning can simply be explained as learning online or offline through CD/DVD type coursework instead of the conventional classroom teaching and learning. It comprises of a wide range of technologies, majorly the Internet and computer. Virtual technology is a subset of Information and Communications Technology (ICT) encompassing the application of information technologies, and communicating same through electronic devices. Virtual technology is a good tool for enlightening biology teaching and learning and an access path to research materials (Naidoo, 2014).

Stressing more on the benefits of virtual technology, Adekunle (2015) stated that it makes delivery of biology instructions very flexible, interactive, learning and lasting. Eya (2016) basically perceives virtual technology as the use of computer-aided-gadgets to aid biology learning. Rees (2014) perceive virtual technology as the use of advanced learning technology that is computer

based, and that makes delivery of biology knowledge flexible, interactive and long lasting. Eya (2016) recaps that virtual technology is the largest and the most challenging application of ICT in the delivery of education. The author sees virtual technology as the process of e-literate teachers interconnecting with e-literate learners with up-to-date books and information using electronic skills.

Virtual technology is a platform among the many e-learning platforms. Virtual technology aimed at large-scale interactive participation and open access via the web. Virtual technology differs from Open Courseware and Open Education Resource in that it opens up opportunities for learners to participate in learning activities, rather than making resources or courseware openly available. Virtual technology provides participants with course materials that are normally used in a conventional education setting such as, lectures, videos, study materials, examples and problem sets. Virtual technology also offers interactive user forums, which are very useful in building a community for students, teaching assistants and professors. Virtual technology development has seen in recent times in education. It is an idea of offering quality education to massive number of students across globe through internet. The first virtual technology emerged from the open educational resources (OER) movement (Wikipedia. 2013).

Statement of the Problem
Despite all the efforts by the Government and many Non-governmental organisations to encourage and facilitate ICT integration in teaching and learning, research shows that in most of the educational institutions, there is very little integration, especially in STEM (Hardman *et al*., 2013; Shehu 2012).If there is to be effective ICT integration in teaching and learning, the teacher must be prepared both intrinsically (sufficient ICT integration skills and positive attitude towards ICT integration) and extrinsically (be provided with sufficient ICT resources and be accorded the necessary support by the administration). It is against this background that the researcher found it useful to investigate teachers' readiness to integrate ICT into the process of teaching and learning, considering that the teacher is a key player in the success of any educational program.

Purpose of the Study
The purpose of this study is to assess pre-service biology teachers' awareness and readiness towards the use virtual learning platforms in Tertiary Institutions of Niger State. The objective of the study is to assess;
1.   Pre–service teachers' awareness on the use of virtual learning for teaching and learning biology
2.   Pre-service teacher readiness to use of virtual learning for teaching and learning biology.

Research Questions
The following research questions were raised and answered in this study are as follows;
1.   Are Pre-service teachers aware of virtual learning for teaching and learning of Biology?
2.   Are the Pre-service teachers ready to use virtual learning for teaching and learning biology?

Scope and Delimitation of the Study
The study was restricted to tertiary institutions in Niger State i.e. Federal University of Technology Minna and Ibrahim Badamasi Babangida University, Lapai. The study also focused towards the use virtual learning platforms in Tertiary Institutions of Niger State.

Methodology
This research adopted was a descriptive survey research design.The population of this study comprised of all One Hundred and Fifty (150) pre-serviced biology teachers from two tertiary Institutions (Ibrahim Badamasi Babangida University, Lapai and Federal University of Technology Minna, Niger state). All One Hundred and Fifty (150) pre-serviced biology teacherswere usedas sample the population of the study. Questionnaire titled 'Assessment of pre-service biology teachers awareness and readiness towards the use virtual learning platforms in Tertiary Institutions of Niger State.'was used for data collection on a four modified rating scale. The instrument was validated by experts in the Department of Science Education and Department of Educational Technology, Federal University of Technology Minna, Niger state, to ensure the face and content validity of the instrument. Reliability of the instrument was determinedUsing Cronbach-alpha, the result computed generated a reliability index 0.76. The questionnaires were directly administered to the respondents with the help of research assistant and all copies were retrieved.The data collected were analyzed using Mean and Standard deviation to analyze the stated Research questions.

Results
Research Question One: Are Pre-service teachers aware of virtual learning for teaching and learning of Biology?

Table 1: Mean Responses of respondents on Pre –service teachers awareness and readiness on the use of virtual learning for teaching and learning biology?

S/N	ITEMS	$\bar{X}$	SD	REMARKS
1.	3P learning	2.14	1.11	Not Aware
2.	Bloomz	2.52	1.05	Aware
3	Buncee	2.26	1.08	Not Aware
4.	Class Dogo	2.27	1.09	Not Aware
5.	Decks Toys	2.23	1.08	Not Aware
6.	Dial pad	2.17	1.1	Not Aware
7.	Edmodo	2.53	1.05	Aware
8.	Od puzzles	2.32	1.1	Not Aware
9.	Edu Lastic	2.38	1.06	Not Aware
10	Edu Planet	2.16	1.11	Not Aware
11	Flip Grid	2.22	1.05	Not Aware
12	Genially	2.25	1.08	Not Aware
13	Google Classroom	2.27	1.09	Not Aware
14	Haybts	2.23	1.08	Not Aware
15	Hapara	2.17	1.1	Not Aware
16	Kahoof	2.33	1.05	Not Aware
17	Kapwing	2.32	1.1	Not Aware
18	Managed Methods	2.38	1.06	Not Aware
19	Microsoft teams	2.51	1.08	Aware
20	Parlay	2.27	1.09	Not Aware
21	Pronto	2.23	1.08	Not Aware
22	See saw	2.17	1.1	Not Aware
23	Slack	2.36	1.05	Not Aware

S/N		$\bar{X}$	SD	
24	Shidy bee	2.32	1.1	Not Aware
25	Sutori	2.38	1.06	Not Aware
26	Webex	2.16	1.11	Not Aware
27	Wooclap	2.22	1.05	Not Aware
28	Ziplet	2.25	1.08	Not Aware
29	Zoom	2.62	1.18	Aware
	Grand Average	**2.29**	**1.08**	**Not Aware**
	N=150			**Decision=2.5**

Table 1: Revealed the results on grand mean average (2.29) which indicated that there is low awareness on pre–service teachers' awareness of virtual learning for teaching and learning biology

Research Question Two: Are the Pre-service teachers ready to use virtual learning for teaching and learning biology**?**

Table 2: Mean Responses of respondents on the Pre-service teachers ready in use of virtual learning for teaching and learning biology

S/N	ITEMS	$\bar{X}$	SD	REMARKS
1.	Use of M.S Word to process professional or personal Document	2.55	1.06	Ready
2.	Use of Internet to compose relevant mails	2.57	1.09	Ready
3	Use of e-mail for sending professional or personal Messages	2.57	1.09	Ready
4.	Use of e-mail for receiving messages	2.72	1.11	Ready
5.	Use of electronic address book (subscription to mailing list)	2.65	1.05	Ready
6.	Sending attachment to e- mail	2.59	1.11	Ready
7.	Forwarding of e-mails	2.53	1.05	Ready
8.	Use of GSM to book appointment or discuss personal problem with teachers	2.52	1.1	Ready
9.	Use of Computer to search for information for assignment	2.51	1.05	Ready
10	Use of Computerized diagnostic assessment to assess learners performance	2.53	0.99	Ready
11	Use of Computer to provide feedback to learners	2.57	1.09	Ready
12	Use of computer for simulation	2.72	1.11	Ready
13	Use of multimedia to present lesson in the classroom	2.65	1.05	Ready
14	Use of computer to practice principles and procedures to learn	2.59	1.11	Ready
15	Use of computer for statistical analysis	2.53	1.05	Ready
16	Use of multimedia to present reports of research	2.52	1.1	Ready
17	Use of computer for self- education	2.51	1.05	Ready

18	Use of Computer to diagnose learning problems	2.53	0.99	Ready
19	Use of computer to chart or discuss assignments with colleagues online	2.57	1.09	Ready
20	Use of computer to discuss assignments with teachers online.	2.72	1.11	Ready
21	Use of recorded video for teaching and learning process	2.65	1.05	Ready
	Grand Average	2.59	1.07	

N=150   **Decision=2.5**

Table 2: Revealed the results on grand mean average (2.59) which indicated that there is high responseof pre-service teachers' readiness in use of virtual learning for teaching and learning biology.

Summary of Findings
1. Low awareness on pre–service teachers' awareness on the use of virtual learning for teaching and learning biology
2. High awareness on pre-service teachers' readiness in the use of virtual learning for teaching and learning biology

Discussion of Results

The results revealed that there is low awareness on pre–service teachers' awareness on the use of virtual learning for teaching and learning biology. The findings of the study with Schreurs, Ehler& Moreau, (2018) virtual learning readiness is one of the important construct investigated in this study and the term is defined by the Oxford Advanced Learner's Dictionary as "The state or quality of being ready; preparation; promptness; aptitude; willingness. Prepared for what one is about to do or experience; equipped or supplied with what is needed for some act or event; prepared for immediate movement or action". Readiness can be considered as students' capacity of adapting themselves to technological innovations, collaborative learning, and self-paced training.

The results revealed that there is high awareness on pre-service teachers' readiness in the use of virtual learning for teaching and learning biology. The findings of the study agreed with Wang and Higgins (2006) argued that technology acceptance takes some time and users can learn how to use new technology at different rates. There may be some reasons for different readiness periods for each learner. According to the Dias (2002), some prejudices against virtual learning such as perceiving virtual learning as intrusion may limit the degree of acceptance of virtual learning. Dias (2002) stated that learners might see virtual learning as an intrusion to their own personal space, which may limit their readiness and acceptance of using virtual devices. Stockwell (2008) conducted another research about pace of readiness. According to the Stockwell (2008), how eager to use the virtual technology is not depending people to have own virtual phones and actually use it. Stockwell (2008) also claimed that patience of instructor with learners is the most important for the early stage of development into virtual learning. Thus, instructors can empathize with the learner, and let the learner investigate and get used to virtual technologies. Moreover, Stockwell (2008) added that learners who did not want to use new technologies at the beginning could see their advantages after observing other learners over time.

Conclusion

The study on assessment of pre-service biology teachers' awareness and readiness towards the use virtual learning platforms in Tertiary Institutions of Niger State concluded that most of the pre-service teachers have low awareness on virtual learning platforms.

Recommendations

Based on the findings of the study, the study recommends that: The pre-service teachers should increase their participation in trainings of virtual learning platforms and the pre-service teachers should always be ready to use virtual platforms to teach in the classroom.

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