

Problems and Prospects of Undergraduate Students' Use of Internet Resources for Online Presentation of Mathematical Concepts

Chika C. Ugwuanyi, William C. Nwachukwu*, & Innocent O. Odo
Department of Science Education, University of Nigeria, Nsukka.
chika.ugwuanyi@unn.edu.ng, william.nwachukwu.234568@unn.edu.ng
*Corresponding author: william.nwachukwu.234568@unn.edu.ng

Abstract- This study was carried out to investigate the problems and prospect of undergraduate students' use of Internet resources for online presentation of mathematical concepts. The study employed descriptive survey research design. The study was guided by two research questions. The population of the study comprised all undergraduate students' in pure mathematics and mathematics education in the University of Nigeria, Nsukka. A sample of 100 undergraduate students was selected through simple random sampling technique. The Instrument used for data collection was Questionnaire on Problems and Prospect of the use of Internet Resources for online Presentation (QPPIROP) and a reliability coefficient of 0.85 was obtained using Cronbach Alpha (α) technique. The research questions were answered using mean (μ) and standard deviation (σ). The findings of the study revealed that insufficient computers in mathematics department, lack of ICT training for lecturers and poor internet facilities were the major problems militating against the use of internet resources for online presentation of mathematics concepts. The study also found that the strategies for enhancing the use of internet resources for online presentation is providing ICT training for every mathematics students and lecturers, provision of more laptops in the departmental libraries and engaging mathematics students in online educational lectures. Based on the findings of the study, it was recommended among others that university management should provide Internet resources and technological equipment like computers, over- head projectors, and free Wi-Fi everywhere in the university premises.

Keywords: *Internet Resources, Online Presentation, Mathematics and Undergraduate Students.*

Introduction

Generally, mathematics is a subject that focuses on problem solving. It is the mother of all sciences and this is to say that mathematics is an indispensable and essential tool necessary for scientific and technological development of a nation. Without mathematics most modern civilization and breakthroughs in science, technology, engineering and computer would have been absolutely impossible. In fact; Mathematics is the pillar of almost every field of the academic enterprise. Ojimba (2012) was of the view that without mathematics, there is no science, without science, there is no modern technology and without modern technology, there is no modern society. Despite the importance placed on the subject, students' mathematics achievement has been relatively poor (Ugwuanyi, Nnolum, William & Inweregbuh, 2019). This poor achievement may and inability to students to learn mathematical concepts any time be as a result of many factors such as inadequate engagement of students in collaborative learning, lack of motivation, teacher's methodology, inadequate use of technology in teaching, lack of internet resources and poor engagement of students in online presentation using internet resources.

Internet resources are the facilities, software or tools that can aid or help the users of the Internet to achieve benefits. These resources are therefore, the means through which document and files stored in the Internet can be accessed. The Internet has many resources that can be utilized for online presentation of mathematics concepts. These resources include:

Internet-enabled electronic devices, Internet Network facilities, Internet Browsers such as Google Chrome, Internet Explorer, Opera and Mozilla Firefox, Internet Search engines, Social Network technologies or sites; services; and Electronic Library resources which could be used for online presentation.

A Presentation is a means of communication that concerns getting a message across to the listeners usually group of learners (Ikekeonwu & Oguike, 2017). Online presentation is an act that brings the traditional classroom activities and instructional process to an anytime, anywhere environment via the Internet. This process provides information to individual learners or to group of students at a distance on how a given mathematical problem can be resolved.

Online presentation provides a more comfortable venue for shy, fearful and reluctant mathematics students to participate in classroom activities and discussions of mathematical concepts. This increases the pool of participants, the likelihood of varied perspectives, and the richness of discussions about some concepts in mathematics. At the same time, the online environment attracts students who are self-motivated and more likely to initiate conversations, pose questions, and collaborate with their peers and teacher, thus it gives room for students' collaboration, cooperation and active involvement in solving mathematics problems. The presentations in the mathematics classroom convey a message or information to students under the guidance, direction, and supervision of the teacher for efficiency and effectiveness, which may invariably affect undergraduate students' academic achievement.

The Internet was perceived as an important tool in improving performance, collaborations, learning experience and outcomes. However, there are many factors and problems that have impeded the effective use of Internet resources for online presentation of mathematical concepts in Nigeria universities. These include lack of Internet facilities, resources and maintenance; lack of Internet browsing skills among students; and lack of ICT trainings and inadequate power supply in universities (Marshall & Taylor, 2015). Factors such as inadequate technical staff, insufficient computers, slow internet speed, lack of straightforwardness of internet resources, lack of school Wi-Fi and poor access to power supply may also negatively affect the full exploitation and usage of internet resources. According to Anunobi (2009), the problems of utilization of online information resources arise from basically: information pollution, destabilization potential, information insecurity, socio-technical issues, potential lack of control over communication as well as the lukewarm attitude of the Nigerian government towards online services.

However, these factors may go a long way in improving students' use of Internet resources for online presentations mathematical concepts. Hence the problem of this study therefore is to identify the problems and ways of improving undergraduate students' use of Internet resources for online presentation of mathematical concepts.

Purpose of the Study

The following are the purposes of this study.

- i. To identify the problems or factors militating against effective use of Internet resources for online presentation of mathematical concepts in the universities.
- ii. To examine the possible strategies and resources that can be used to improve undergraduate students' use of Internet resources for online presentation of mathematical concepts in the universities.

Research Questions

The following research questions have been posed to guide this study:

1. What are the problems or factors militating against undergraduate students' use of Internet resources for online presentation of mathematical concepts in the universities?
2. What possible strategies and resources can be used to improve undergraduate students' use of Internet resources for online presentation of mathematics concepts in the universities?

Methodology

This research employed descriptive survey research design. Descriptive survey research design is one which is aimed at collecting data, and describing in a systematic manner the characteristics, features, or facts about a given population (Nworgu, 2015). Descriptive survey research design is appropriate for this study it is appropriate for sourcing participants' opinion on the problems and prospect of the use of Internet resources for online presentation. The study was carried out in the University of Nigeria, Nsukka, due to the availability of Internet resources and facilities such as Wi-Fi, Laptop for online presentation.

The population of the study comprised of 400 undergraduate students in the department of pure mathematics and mathematics education unit of science education in the University of Nigeria, Nsukka. The sample of this study consist of one hundred (100) pure mathematics and mathematics education undergraduate students of the University of Nigeria, Nsukka who were selected through Simple random sampling technique. This was because their students offer mathematics courses from their first to fourth year in the university. Instrument used for data collection was Questionnaire on Problems and Prospect of the use of Internet Resources for Online Presentation (QPPIROP). Three (3) experts subjected the questionnaire to face validation from the University of Nigeria Nsukka. The reliability of the instrument was ascertained using Cronbach Alpha, which gave 0.85 index value. The data were collected and analyzed through basic methods of descriptive statistics. Specifically, the research questions were answered using means and standard deviations. The level of acceptance of the criterion mean is 2.50.

Results

Data were analyzed, summarized and presented in the following tables below according to their respective research questions

Research Question One

What are the problems militating against undergraduate students' use of Internet resources for online presentation of mathematical concepts in the universities?

Table 1: Descriptive Statistics on the Problems Militating Against Effective Use of Internet Resources for Online Presentation of Mathematics Concepts:

S/N		N	Mean	Std. Deviation	Remarks
1	Insufficient computers and laptops in mathematics department	100	3.29	.83	Accepted
2	Lack of straightforwardness of internet resources	100	3.11	.61	Accepted
3	Poor internet facilities e.g. Wi-Fi and low bandwidth subscription	100	3.10	.85	Accepted

4	It Requires a lot of skills	100	2.76	.86	Accepted
5	Poor access to power supply in mathematics classrooms	100	2.99	.87	Accepted
6	Use of PowerPoint for presentation is costly and time consuming	100	2.82	.89	Accepted
7	Lack of information and communication technology (ICT) training for students' lecturers in the mathematics department	100	3.12	.68	Accepted
Grand (Overall) Mean			3.02	.50	Accepted

*Source: Field Work

From Table 1, it can be seen that all the seven (7) items (1 - 7) with their mean ranging from 2.76 to 3.29 and grand mean of 3.02 were accepted by undergraduate students of the department of pure mathematics and those in mathematics education as the problems and challenges against the use of internet resources for online presentation. The standard deviation of each of the items, which ranged from 0.44 to 0.86 as well as that of the grand mean value implies that all the respondents share similar opinion on the problems militating against effective use of internet resources for online presentation of mathematical concepts.

Research Question Two

What possible strategies and resources can be used to improve undergraduate students' use of Internet resources for online presentation of mathematical concepts in the universities?

Table 2: Descriptive Statistics on the Possible Strategies and Resources Needed to Improve Undergraduate Students' Use of Internet Resources for Online Presentation of Mathematical Concepts.

S/N		N	Mean	Std. Deviation	Remarks
8	Provision of more computers and laptops in the departmental libraries	100	3.59	.60	Accepted
9	Providing ICT trainings for every mathematics students and lecturers	100	3.61	.64	Accepted
10	Subscription of higher bandwidth e.g. free Wi-Fi in mathematics classrooms	100	3.49	.61	Accepted
11	Availability of internet facilities such as mathematics ICT laboratory room	100	3.53	.61	Accepted
12	Training students on how to effectively use their mail for educational purposes	100	3.54	.57	Accepted
13	Regular power supply in mathematics classroom and students' hostel	100	3.42	.71	Accepted
14	Engaging every mathematics students in online educational lectures	100	3.54	.59	Accepted
Grand (Overall) Mean			3.53	.45	Accepted

*Source: Field Work

Table 2 shows that the mean responses of the students on the possible strategies on how to improve the use of internet resources for online presentation ranged from 3.49 to 3.61 and all the items were thus accepted as each mean is above the 2.5 benchmark. The Standard Deviation of all the items, which ranged from 0.57 to 0.64, revealed that all the respondents are relatively not far from one another in their individual opinions. The grand mean and standard deviation of 3.53 and 0.45 respectively indicates that students have similar opinions and idea on the possible strategies and resources needed for online presentation of mathematical concepts.

Discussion

Findings from Table 1, showed that all the seven (7) items (1 - 7) with grand mean of 3.02 were accepted by undergraduate students of the department of pure mathematics and those in mathematics education as the problems and challenges against the use of internet resources for online presentation as the mean is above the 2.5 benchmark. Hence the major problems militating against the use of internet resources for online presentation of mathematics concepts among undergraduate students are; insufficient computers or laptops in mathematics department, lack of information and communication technology (ICT) training for lecturers in the mathematics department as well as poor internet facilities e.g. Wi-Fi and low bandwidth subscription impede effective online presentation. The findings of this present study is in line with the findings of Marshall & Taylor (2015), and Yesilyurt et al. (2014) as the authors opined that inadequate technical staff, insufficient computers, slow internet speed, lack of straightforwardness of internet resources, lack of school Wi-Fi and poor access to power supply are the main challenges of internet usage for online presentation.

In a different view, Ozioko (2007) disclosed that the major problem associated with the use of Internet resources is poor funding of higher education in Nigeria and lukewarm attitude of the Nigerian government towards the provision of online services. Also Apuke & Iyendo (2018) investigated the place of the Internet in academic research and learning of students. The study noted that students perceived that the lack of digital readiness among their staff and institution, the absence of electronic library for easy accessibility to journals from the scientific database, and inefficient cyber cafe and internet facility within their university settings were the main issues discouraging the utilization of the internet resources for presentation of difficult concepts within their institutions.

Finding from Table 2 showed that the mean responses of the students on the possible strategies on how to improve the use of internet resources for online presentation ranged from 3.49 to 3.61 and all the items were thus accepted as each mean is above 2.5 benchmark. Hence the major solution to the problem of online presentation is providing ICT training for every mathematics students and lecturers, as well as provision of more computers and laptops in the departmental libraries and engaging every mathematics students in online educational lectures. This finding agrees with the report of Ani (2005) that there is need for effective training on Internet access and use in university libraries in Nigeria for optimal utilization of electronic information sources. The study also revealed that the availability and subscription of higher bandwidth e.g. free Wi-Fi in mathematics classrooms; regular power supply in mathematics classroom and in hostel as well as engaging every mathematics students in online educational lectures improves undergraduate students' academic achievement in mathematics. Thus, good governance, eradication of corruption and adequate funding of institutions of higher learning will go a long way in improving students' use of internet resources for learning in the universities.

Educational Implication

This study identified many challenges and problems that militate against the effective use of Internet resources for online presentation of mathematics concepts to include: Insufficient computers and laptops in mathematics department, poor access to power supply in mathematics classrooms and poor Internet facilities. This has implication for adequate provision of Internet resources and basic Internet education programme for undergraduate students in universities. This implies that the unavailability of Internet resources has affected the rate with which students engage in online presentation, which in turn reduces students' academic achievement in mathematics. Hence, federal government should provide adequate Internet facilities and resources in the universities. Also where internet resources are fully available, students are more encouraged to use the resources for learning, sharing relevant information and engaging in online presentation of abstract mathematical concepts.

Conclusion

The use of Internet resources for online presentation of mathematical concepts has been limited by various problems such as inadequate access to Internet facilities, insufficient computers and poor power supply. Therefore, it can be concluded that many problems exists which militate against the undergraduate students' use of Internet resources for online presentation of mathematical concepts. Hence, there is urgent need for school administrators and government to provide facilities and equipment that could encourage the utilization of Internet resources in the universities. Mathematics concepts should be presented online through the use of technology aided instruction, email, electronic and computer-based methods.

Recommendations

The following recommendations have been made based on the findings of the study

- University management should provide internet resources and technological equipment like computers, over- head projectors, subscription of higher bandwidth e.g. free Wi-Fi in mathematics classrooms, and there should be regular power supply in mathematics classroom.
- There should be adequate funding of university libraries and information centers for the provision of more Internet resources such as electronic journals, electronic books, electronic books (e-books), electronic mail, online data analysis software, university websites, and archives to meet the users' needs.
- Internet resources and online presentation packages should be made adequately available in Nigeria Universities through collaborative efforts of the University authorities, government and non-governmental organizations.
- Mathematics educators should engage students in computer-assisted instruction through video conferencing, use of e-mail, electronic library and presentation software.

REFERENCES

- Ani, O.E. (2005). Evaluation of virtual libraries in Nigeria: a myth or reality? *Journal of Information Science*, 31 (1), 66 – 69.
- Anunobi, W. L. (2009). A Successful Implementation of a National Information Technology Infrastructure: *Journal of Management Information Science*, 1(1), 1-20

- Apuke, O.D., & Iyendo T.O. (2018). University students' usage of the internet resources for research and learning: forms of access and perceptions of utility. *Heliyon*: Published by Elsevier Ltd. <https://doi.org/10.1016/j.heliyon.2018.e01052>
- Ikekeonwu, G.A.M, & Oguike, O.E. (2017). *Computer Application*. Revised edition, Enugu: Immaculate publications limited.
- Marshall, S., & Taylor, W. (2015). ICT in education: Innovation, implementation, perceptions and experiences. *South Africa International Journal of Education and Development using Information and Communication Technology (IJEDICT)*, 11(1), 2-3.
- Nworgu, B.G. (2015). *Educational Research.' Basic Issues and Methodology'*. Third edition, Enugu: University Trust Publishers.
- Ojimba, D. P. (2012). Strategies for Teaching and Sustaining Mathematics as an indispensable tool for technological development in Nigeria. Retrieved on 19th October 2014 from <http://www.mcser.org/images/stories/MJSS-Special>.
- Ozioko, C. J. (2007). The Education of Library Users in Nigeria. *Education Libraries Bulletin*, 26(1), 1-3.
- Ugwuanyi, C.C, Nnolum, C.T, Nwachukwu, W.C, Inweregbuh, C.O, (2019). Influence of student's self-concept on their academic achievement in secondary school mathematics. *International Journal of Research and Innovation in Social Sciences (IJRISS)*, 3(11), 272-277.
- Yesilyurt, E., Basturk, R., & Kara, I. (2014). The Effect of Technological Devices on Student's Academic Success: Evidence from Denizli. *Journal of Internet and Application Management*, 5(1), 39-47.