

Evaluation of the Impact of Webinar on Teaching Mathematics to Undergraduate Students

Udobia Elijah Etukudo 

Department of Mathematics Education,
 Federal College of Education (Technical),
 Omoku, Rivers State, Nigeria

Foluke Bosede Eze 

Department of Science Education,
 Federal University, Otuoke, Bayelsa State,
 Nigeria

Abstract

Webinar is an application of video conferencing to communicate with a group of persons and have discussions as if all are in the same place. It is a handy tool for distance learning and educational-based communication. Employing webinars in education has the advantage of helping users achieve their goals in their comfort zones. In this study, a survey of 250 undergraduate students and 50 mathematics teachers on the impact of webinars on the teaching of mathematics was carried out. The students were divided into 50 students majoring in mathematics and 200 students who offered mathematics as a compulsory course. All the teachers were university lecturers currently teaching mathematics in the universities in Rivers State, Nigeria. All the subjects are familiar with the webinar. Fourteen-item Likert Scale questionnaire was used for the study. Data collected were analyzed using a chi-square test at a .05 significance level. The result reveals that webinars are an acceptable medium for teaching mathematics but with reservations. The proviso is that it should be used where one-to-one interaction is impossible. Secondly, the webinar package should be wealthy so that while discussing, it would be easy to understand and waste of resources on data avoided.

Keywords: evaluation, impact, webinar, teaching, mathematics, undergraduates

Introduction

There has always been the yearning to create an alternative medium of learning and teaching and an all-around communication modality that could close the gaps in passing information and instruction at the desired time and pace, notwithstanding the location or distance. Webinar has come to fill the lapses. It is an acronym for web and seminar (Cook, 2019). Where internet connectivity is strong, the webinar offers exciting interactive experiences to learners as it provides easy access, anonymity, convenience, flexibility, complete interactivity, and contact with a wider audience (Muritala & Onojah, 2021; Pappas, 2024). Webinar provides the possibility for teachers, instructors and lecturers to have access to their students at dispersed locations as if they are in the same place, and even more comfortably as it removes stage freight complexes that accompany learners with low self's esteem, as a result of unrecognizability during presentation (Pappas, 2024).

Webinars are highly relevant, where normal face-to-face interaction is impossible (Burns, 2020), and they can carry the message to people in remote parts of the globe, provided internet access and steady networks are available. Webinar is highly recommended as a means of ensuring that learning takes place in the most convenient atmosphere (Ebner & Gegenfurtner, 2019; Hoke et al., 2018; Richmond, 2019) as Gupta and Sengupta (2021) admitted that webinar has numerous advantages,

supporting Kumar et al. (2021) that in a survey of 253 participants webinar was found to be an acceptable medium of teaching and learning with enviable Gains.

Statement of the Problem

Webinars have been accepted as an efficient means of delivering lectures, teaching, and learning effectively in different disciplines. However, little is known about the application of webinars in lectures, teaching and learning mathematics. Many methods and approaches have been used to teach mathematics, but the result still falls short of expectations. In this study, the impact of webinars on mathematics teaching is investigated.

Significance of the Study

The application of webinars in teaching and learning mathematics at the tertiary education level is investigated. It is helpful for all teachers and students of mathematics who need a procedure for teaching and learning mathematics at their convenience and can adopt webinars.

Purpose of the Study

The study investigates the importance and impact of webinar applications in teaching and learning mathematics at the

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Correspondence concerning this article should be addressed to Udobia Elijah Etukudo, Department of Mathematics Education, Federal College of Education (Technical), Omoku, Rivers State, Nigeria. **Email:** udobiaetukudo@gmail.com

university level. It is to make available an efficient and effective method of teaching and learning mathematics that can be applied where face-to-face interaction is not possible. It is to assess webinars as an alternative method of delivering and receiving lectures in mathematics.

Scope of the Study

The study is carried out with all the mathematics students and lecturers at universities and other degree-awarded institutions in Rivers State of Nigeria. Students who study mathematics as a compulsory course at all levels of their first-degree program were included.

Hypothesis

There is no significant difference in the impact of webinars in teaching and learning mathematics among university students and teachers (lecturers).

Methodology

Design

The survey design was used in the study.

Participants

A total of 300 participants were involved in the study. This comprised 250 students, and 50 lecturers were used in the study. The 250 undergraduate students and 50 mathematics teachers (lecturers) were selected from the three universities and one degree-awarding tertiary institution in Rivers State, South-South, Nigeria, using stratified random sampling. The students were divided into 50 students majoring in mathematics and 200 students who offered mathematics as a compulsory course. All the teachers were university lecturers who are currently teaching mathematics in the universities in Rivers State, Nigeria. All the subjects are familiar with the webinar.

Data Collection

Fourteen items and five five-point Likert Scale questionnaires were used for the study. The items comprised seven positive and negative items. The items are on the effectiveness of webinar to increase achievement in mathematics, improve attitude towards mathematics, afford users easy access to teaching and learning, provide convenience for learning, provide confidentiality during the interaction, pave for individuality in learning, and is cost-effective. The items have a parallel form reliability coefficient of .83 and were face-validated by four experts.

Data Analysis

Data collected were analyzed using a chi-square test at .05 level of significance.

Results and Discussion

From Table 1, the calculated value of chi-square is given by $\chi^2 = 9365.14 - 9350 = 15.14$, which is less than the critical value chi-square at .05 level of significance, which is $\chi^2_{critical} = 21.026$ with the degree of freedom of $\gamma = (3 - 1) (7 - 1) 2 \times 6 = 12$, at .05 level of significance. This leads to accepting the hypothesis that "There is no significant difference in the impact of Webinar in teaching and learning mathematics among university students and teachers (lecturers)." Both the lecturers and the students accept webinars as contributing effectively to improvement in their attitude towards mathematics and helping increase students' achievement

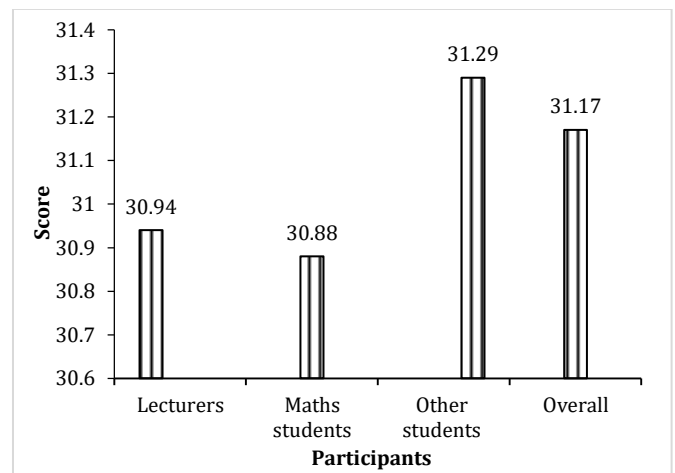
in mathematics. They also agree that webinars provide easy access to learning, confidentiality, and individuality during learning, and they provide learning at convenience and a meager cost. However, the total score of 9350 and the grand mean $9350 \div 300 \times 7 = 4.45$ implies that all the participants, on average, strongly agreed or agreed that webinars are effective in teaching and learning mathematics. The result of the data collection and test of the hypothesis is given in Table 1.

Table 1
Scores of Participants

Items	Lecturers	Students taking compulsory mathematics courses	Total
Increase in achievement in mathematics	235	967	1450
Improvement in attitude towards mathematics	247	852	1335
Provide ease of access	175	753	1111
Provide confidentiality	247	973	1468
Provide individuality	221	870	1289
Provide convenience	247	998	1494
Is cost-effective	175	846	1203
Total	1547	6259	9350

The research reveals an agreement between the students and the lecturers that webinars are an efficient medium of instructional delivery that can be used to boost achievement in mathematics and improve attitudes towards mathematics. The finding of this study is supported by (Burns, 2020; Cook, 2019; Pappas, 2024), who all recommend webinars as a good means of teaching and learning where internet access is available.

Figure 1
Scores of the Participants



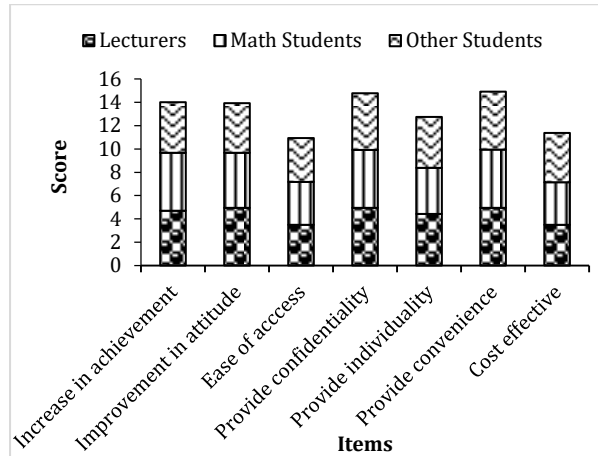
The chart in Figure 1 above shows the participants' mean scores and the overall. This demonstrates their assessment of the impact of webinars in teaching and learning mathematics. Students who offer mathematics as a compulsory course had higher mean scores on accepting webinars as an effective means of teaching and learning mathematics, followed by lecturers. However, all the participants scored above 30.8 of the 35-point maximum score for a participant.

Figure 2 gives the rating of the mean scores of the participants on each item. It is clear that all the items were agreed upon as being effective contributions of webinars to teaching and learning. Nevertheless, the issue of internet access was not raised in this study, which was possible because all the participants reside in

urban and suburban areas with regular and active networks. Using a pocket modem and hotspot enables webinar users to switch from one network to the other during activities. However, the participants had used webinars in teaching and learning mathematics and had life experiences of how it worked. It was persons who have practical use of webinar that were involved in the study. This makes webinars ideal where distance and other limiting factors are barriers.

Figure 2

Rating of the Mean Scores of the Participants on Each Item



Summary

The study was conducted using survey methods to evaluate the impact of webinars on the teaching and learning of mathematics. Three hundred participants were involved in the study. The result reveals that both students and lecturers accept webinars as an alternative means of delivering instruction. They all accepted that webinar are efficient in the teaching and learning scenario,

Conclusion

The study revealed that webinars are an effective medium for teaching and learning mathematics at the undergraduate level. The acceptance of webinars by both students and lecturers demonstrates their potential to enhance achievement and improve attitudes towards mathematics. The participants agreed that webinars provide easy access to learning, maintain confidentiality, support individualized learning, offer convenience, and are cost-effective. Given these advantages, webinars represent a viable alternative to traditional face-to-face instruction, especially when direct interaction is not feasible. This study underscores the need for integrating webinar technology into the educational framework to facilitate continuous and effective learning experiences.

Recommendation

Based on the findings of this study, the following recommendations are proposed:

1. Adoption and Integration: Educational institutions should adopt webinars as a complementary tool for teaching mathematics. This integration can provide flexibility and continuity in education, particularly in scenarios where traditional classroom settings are not possible.
2. Training and Development: Teachers and students should be trained on how to effectively use webinar technologies. Workshops and training sessions can help in familiarizing users with the tools and methodologies that can enhance their teaching and learning experiences.
3. Resource Development: Mathematics educators should develop comprehensive instructional materials tailored for webinar delivery. These materials should be designed to

maximize engagement and understanding, leveraging the unique features of webinar platforms.

4. Infrastructure Enhancement: Institutions should invest in robust internet infrastructure to ensure stable and high-quality webinar sessions. Reliable connectivity is crucial for the success of webinars, especially in regions with inconsistent internet access.
5. Continuous Evaluation: Regular assessments should be conducted to evaluate the effectiveness of webinars in teaching mathematics. Feedback from students and teachers can guide improvements and ensure that the webinar content remains relevant and effective.
6. Policy Formulation: Educational policymakers should consider formulating guidelines and policies that encourage the use of webinars in academic curricula. Such policies can support the broader adoption and standardization of webinar-based learning.

By implementing these recommendations, educational institutions can harness the benefits of webinar technology to improve the teaching and learning of mathematics, ensuring that education remains accessible, engaging, and effective.

References

- Burns, M. (2020, March 16). *Taking it online: Virtual teaching webinars*. E-learning Industry. Retrieved March 2, 2024, from <https://elearningindustry.com/online-virtual-teaching-webinar-technologies>
- Cook, J. (2019, September 19). *Live online learning: What are the differences between webinar and virtual classroom*. E-learning Industry. Retrieved March 3, 2024, from <https://elearningindustry.com/live-online-learning-webinar-vs-virtual-classroom>
- Ebner, C., & Gegenfurtner, A. (2019). Learning and satisfaction in webinar, online, and face-to-face instruction: A meta-analysis. *Frontiers in Education*, 4. <https://doi.org/10.3389/feduc.2019.00092>
- Gupta, S. K., & SenGupta, N. (2021). Webinar as the future educational tool in higher education of India: A Survey-Based Study. *Technology, Knowledge and Learning*, 26(4), 1111–1130. <https://doi.org/10.1007/s10758-021-09493-7>
- Hoke, A. M., Francis, E. B., Hivner, E. A., Simpson, A. J. L., Hogentogler, R. E., & Kraschnewski, J. L. (2018). Investigating the effectiveness of webinars in the adoption of proven school wellness strategies. *Health Education Journal*, 77(2), 249–257. <https://doi.org/10.1177/0017896917734017>
- Kumar, G. K. C., Rangappa, K. B., & Suchitra, S. (2021). Effectiveness of seminar and webinar in learning experience: An empirical analysis. *Education Indian Journal: A Quarterly Reference Journal of Dialogue in Education*, 10(2), 247–257. <http://dx.doi.org/10.5281/zenodo.5599424>
- Muritala, N. K., & Onojah, A. (2021). Effect of webinar multimedia platform on students' academic performance in selected educational technology concepts in University of Ilorin. *Indonesian Journal of Multidisciplinary Research*, 2(1), 9–20. <https://doi.org/10.17509/ijomr.v2i1.38622>
- Pappas, C. (2021, October 20). *Webinars to add to your Watchlist*. E-learning Industry. Retrieved March 2, 2024, from <https://elearningindustry.com/elearning-webinars-to-add-to-your-watchlist-the-adobe-edition>
- Pappas, C. (2024, April 7). *Webinar in education: Why and can they be utilized?* E-learning Industry. Retrieved March 3, 2024, from <https://elearningindustry.com/webinars-in-education-why-and-how-can-they-be-utilized>
- Richmond, D. (2019, July 9). Lectures in your living room: 8 benefits of webinars in education. *Megameeting*. Retrieved March 3, 2024, from <https://www.megameeting.com/news/benefits-of-webinar-in-education>
- Sivaramalingam, J., Rajendiran, K. S., Mohan, M., Premalal, K. S., Yadhav, S. K., Satyamurthy, G. D. V., Rangasamy, S., Diravyaseelan, M., Jamir, L., Pandey, D. K. U., Mohan, S. K., & Cassinadane, A. V. (2022). Effect of webinars in teaching-learning process in medical and allied health science students

during COVID-19 pandemic: A cross-sectional study. *Journal of Education and Health Promotion*, 11, 274.
https://doi.org/10.4103/jehp.jehp_1450_21

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