

TECHNOLOGY MEDIATED INSTRUCTION AND EFFECTIVE UTILIZATION IN PRIVATE SECONDARY SCHOOLS IN CALABAR METROPOLIS OF CROSS RIVER STATE, NIGERIA: IMPLICATION FOR PREPAREDNESS AGAINST RECURRING PANDEMIC

**Obogo, Godwin O.; Effiom, Anthony P.
& Chidozie, Veronica Ngozi**

Department of Educational Psychology
Faculty of Educational Foundation Studies
College of Education, University of Calabar

Abstract

This study investigated technology-mediated instruction and its effective utilisation and private secondary schools' preparedness against the recurrence of any pandemic in the Calabar metropolis of Cross River State, Nigeria. Two hypotheses were formulated to guide the study. The survey design was used for the study. The population of the study comprised of 1450 teachers in the 45 registered private secondary schools in the study area. A sample of 240 teachers was purposively selected from 12 schools for the study. The statistical tool used for data analysis was the One-way analysis of variance (ANOVA). The instrument used for data collection was the "Technology Mediated Instruction and Instructional Effectiveness Questionnaire" (TMIEQ). The response format for the instrument was the 4-point Likert scale of Strongly Agree (SA), Agree (A), Disagree (D), Strongly Disagree (SD). The findings of the study revealed that PowerPoint was not significantly and effectively utilised in the instructional delivery in private secondary schools in the Calabar metropolis of Cross River State. The WhatsApp technology was more effectively utilised as compared to the PowerPoint. This is to say that technology utilisation in instructional delivery was not very effective, and this did not depict any preparedness of the private secondary schools against any pandemic outbreak at any time. It was concluded that instructional delivery in private secondary schools was not effectively mediated with technological devices except the WhatsApp which was the only technological tool utilised. It was recommended that Private school owners should ensure they provide the necessary technological equipment, and train staff on their usage.

Key words: *Technology-mediated, instruction, effective utilisation, preparedness, private secondary schools, Calabar metropolis, recurring pandemic.*

Introduction

Baber (2021) observed that while there had been previous crises that affected the education sector, the magnitude of the COVID-19 pandemic was unprecedented. During the COVID-19 pandemic, digital technology was introduced particularly in the education sector for continuous and enhancement of teaching and learning, as social distancing became imminent. Also, Ukeme and Uguma (2024) asserted that the outbreak of COVID-19 which brought the whole world to a standstill, with education delivery being the worst hit, opened opportunities for several educators to come up with effective digital technological learning devices that could be utilized in both in and outside the classroom. This phenomenon called for the attention of curriculum designers to revisit curriculum contents to reflect more of ICT components to meet the standards of global practices. Computer mediated instruction became

inevitable. This refers to the use of computer related digital facilities to enhance teaching and learning. These facilities include tik-tok, WhatsApp, e-mail, Instagram, telegram, PowerPoint, and others.

Prior to the outbreak of the COVID-19 pandemic, the traditional face-to-face classroom teaching and learning was the predominant pedagogic method, particularly in Nigeria. With the outbreak of the COVID-19 pandemic and with global e-learning approach, there is the compelling need to sustain the digital (e-learning) technology as a guide against any unexpected recurrence of such disasters.

Apparently, teachers' acceptance of new technologies seems to be controversial. While some have effectively integrated computer tools into the teaching and learning process, others have been cautious in their acceptance, and some have simply rejected these technologies. The role of the teacher in terms of using computer must change to enable them cope with the recent developments like the COVID-19 pandemic and its attendant challenges. These challenges range from physical and social distancing through nose and mouth masking, regular hand washing and use of alcoholic-based sanitizer and so on.

Barnes (2020) observed that the introduction of digital technology in teaching and learning (computer mediated instruction) enabled educators to continue teaching and learning during the lockdown and social distancing requirements. Ratten, (2021) acknowledged that many teaching tasks that were done manually became digitalized, this revolutionised teaching and learning (Ogunode & Paul, 2023; Ebele & Paul, 2020). Szopinski and Bachnik (2020) noted that educators are continually experimenting with new digital technologies to make students utilise technology and showcase new learning methods. School managements in the Calabar metropolis seemed to respond promptly to the challenges of the COVID-19 pandemic using computer technology in instructional delivery among other measures, but there is much doubt if this practice is still sustained.

PowerPoint mediated instruction and effective utilization

PowerPoint is the presentation of a teaching-learning programme shown on a computer screen. Teachers use PowerPoint to structure lessons effectively, incorporate multimedia elements, and facilitate active learning (AiPPT. com, 2025). AiPPT noted that PowerPoint improves teaching by its organisation of lessons, integrating of multimedia, and encouragement of student interaction, and making learning more effective. The PowerPoint helps teachers through automated slide creation, ensuring well designed presentation with minimal effort. It emphasizes that the effectiveness of PowerPoint is predicated on its clear structure, engaging visuals, its interactive elements, and concise content presentation.

According to Amadi and Orji (2017), PowerPoint is adjudged today as one of the most popular. Its use is increasing geometrically, not only as a presentation programme but as an online instructional package, which can be easily integrated with other application programmes. They further asserted that PowerPoint presentations are excellent tools for use in the classroom. Amadi and Orji identified the importance of Microsoft word PowerPoint in teaching and learning to include making work easy, fast, and more professional, having a lot of design templates for presentation, communicating with audience through electronic slides, ability to be run on network/internet, and online instruction usage. Despite the bountiful benefits, Amadi and Orji noted the disadvantages of PowerPoint programme to include corruption or virus infestation, discouragement of class (physical) attendance, power or electricity challenge, teachers' fear of technology use, wrong choice of design, and many more. Also, the Centre for innovative teaching and learning (n.d.) observed that students with visual or hearing impairments may be disadvantaged in PowerPoint presentations. However, the negative side does not outweigh the positive that in any way can discredit the use of PowerPoint in instructional delivery.

According to Gambari, Yusuf and Balogun (2015), proponents of PowerPoint argued that it increases visual quality in the learning process, and it takes less time to present a subject matter, therefore more materials can be covered in the classroom. Meanwhile, opponents contest that it diminishes creativity and innovation. Supporters argue that it helps to sustain students' interests and attention on the lesson. Uzun and Kilis (2019), noted that PowerPoint is one of the most used technologies both by students and teachers at school. They said it seemed there was an implicit premise that the use of PowerPoint was regarded to be equal to the use of ICTs in teaching and learning, when teachers are asked to report on their ICT usage in the classroom, they mostly mention their PowerPoint practices (Paul et al., 2024; Paul, et al., 2019; Paul, et al., 2023). De-Wet (2022) observed that despite access to technology in schools which has increased significantly, the ability to use technology in classroom instruction lags access. de Wet noted that PowerPoint can be a highly effective tool to aid learning, but if not used carefully, may instead discourage, and hinder learning. Abubakar, et al (2020), asserted that PowerPoint as a tool is becoming more and more widespread among teachers who wish to integrate multimedia technology into their teaching. They said the popularity of PowerPoint usage comes from the belief that using audio and visual inputs improves learning.

WhatsApp mediated instruction and effective utilisation

According to iProject Master (n.d.), the emergence of WhatsApp has revolutionised communication and facilitating teaching and learning activities in recent years. WhatsApp is a student-centred asynchronous teaching app that uses online learning resources to facilitate information sharing beyond the constraints of time and place among a network of people. Asynchronous learning is based on student-centred approach that emphasizes the importance of peer-to-peer interactions. Denysiuk, Plavutska and Fedak (2018), observed that this approach combines self-study with asynchronous interactions to promote learning, and can be used to facilitate learning in a traditional on-campus education, distance education, and continuing education.

WhatsApp is one of the most popular text and voice messaging apps. It is free to use, and one can send messages, make voice calls, and host video chats on both desktop and mobile devices (Nwaka, 2024). Maphosa, Dube and Jita (2020) argued that one major problem of e-learning implementation in developing countries is a lack of access to laptops and computers by student at their homes. Maphosa et al noted that one feature that has made WhatsApp to be very useful among students worldwide is its ability to create groups within the application which allows users to collaborate on tasks and communicate from anywhere and at any time. Lecturers can deliver voice notes and explain some concepts to their students. Members of the group can collaboratively participate and engage in a discussion on a selected topic and each member can pose a question to the teacher or other members instantly.

From a study by La Hanisi, Risdiyany, Dwi Utami and Sulisworo (2018), one major benefit of using WhatsApp is that it enables teaching and learning to occur through their most personal gadgets in a fun-based environment and conveniently sharing and accessing information in real time. They concluded that their study demonstrated how WhatsApp was useful in supporting teaching and learning during the COVID-19 lockdown when other e-learning platforms failed due to data constraints and device limitations. They noted that the learners' positive perception on the effectiveness of the use of the WhatsApp in instructional delivery suggested the easiness and adoption for its integration to support teaching and learning.

In a study by Anakwe, Kujoh, Etim and Effiom (2022), on teachers' perceived adoption of WhatsApp as an educational tool for curriculum content delivery in Calabar

Municipality of Cross River State, Nigeria, they found that teachers often adopted WhatsApp usage as an educational tool. Ogbudu, Bepeh, Ogbiji, and Liwhu (2023) studied the perceived influence of WhatsApp usage on students' academic achievement in the University of Cross River State, they found that the usage of the facility was significantly high, and its effective usage led to a significantly high influence on students' academic achievements in Vocational Guidance.

Statement of the problem

The outbreak of COVID-19 pandemic posed enormous threat to human life globally. It necessitated the use of several strategies in combating the pandemic. These strategies included social distancing, use of nose-mask, frequent hand washing with clean running water and hand sanitizers, among others. Activities involving human social gathering were greatly obstructed. Schools, churches, mosques, markets, recreational arenas were all affected. The education received a more devastating hit of the time. There was a great breakdown in knowledge transmission in institutions of learning globally, especially in the developing parts of the world like Nigeria.

Amid this crisis caused by the COVID-19 pandemic, there were great challenges using effective alternative technological channels for instructional delivery other than the tradition face-to-face approach, without violating the pandemic rules. The application of technology remained the nearest option. The options were quite in view, but their availability and affordability, human skills, sources of power, among others were great challenges. Instructional delivery was greatly hampered. Several institutions of learning closed for the meantime, thinking of the way forward.

As time went on, some schools began by reducing the number of learners and teachers per learning session, gradually adopting technological approaches like training staff on the use of PowerPoint, WhatsApp platforms and others to mediate instructional delivery, yet many schools seemed not to effectively utilize these technologies and could not sustain or improve on their usage as the tempo of the pandemic diminished. The concern of this study therefore is to investigate the mediation of instructional deliver with technological tools and how effective to ensure the preparedness of private secondary schools against the recurrence of such pandemic as COVID-19. The study was focused on the private schools because they are in a better position to promptly respond to this challenge through staff training, purchase of equipment and maintenance of the technological.0 tools used in instructional delivery, considering the fate of their business.

Purpose of the study

The main purpose of this study was to investigate technology mediated instruction, its effective utilisation, and secondary schools' preparedness against recurring pandemic in the Calabar Metropolis of Cross River State, Nigeria. Specifically, this study investigated:

1. the utilisation of PowerPoint and its effectiveness in instructional delivery in private secondary schools in the Calabar Metropolis.
2. the use of WhatsApp in instructional delivery and its effectiveness in private secondary schools in the Calabar Metropolis.

Research hypotheses

1. Power point is not effectively utilised in instructional delivery in private secondary schools in the Calabar Metropolis of Cross River State.
- 2 WhatsApp is not effectively utilised in instructional delivery in private secondary schools in the Calabar Metropolis of Cross River State.

Methodology

The research design adopted for this study was the Survey research design. This design was considered appropriate because it allows the researcher to make inference and generalization of the population by selecting and studying the sample for the study. The population of the study was private secondary school teachers in the Calabar metropolis comprising of Calabar South and Calabar Municipality Local Government Areas. The area makes up the capital of Cross River State.

There is a total of 45 private secondary schools in the study area. Twelve schools were purposively selected for this study. The total population of teachers in the selected schools was 458. A sample of two hundred and sixty (240) respondents was randomly selected for the study. The selection was done through the stratified random sampling technique. The stratification was based on sex. The simple random sampling technique was used to select the sample. This was to give equal and independent opportunity to all the members of the population to be selected for the study. The questionnaire was the main instrument used for data collection. The instrument was named "Technology Mediated Instruction and Instructional Effectiveness Questionnaire (TMIEQ). The instrument was structured in a four-point Likert type scale, (Strongly Agree, Agree, Disagree and Strongly Disagree). The instrument was subjected to face and content validation by experts in measurement and evaluation in the Faculty of Education, University of Calabar. The reliability estimate of the instruments was established through Cronbach Alpha reliability method and the reliability coefficient ranges from 0.79 to 0.83 this value was high enough to be considered good for a research instrument. One-Way Analysis of Variance (ANOVA) was the statistical analysis technique adopted to test the hypotheses under study.

Presentation of result

In this section each hypothesis is re-stated, and the result of data analysis carried out to test it is presented. Each hypothesis of the study was tested at 0.05 level of significance.

Hypothesis one

PowerPoints is not effectively utilised in instructional delivery in private secondary school in the Calabar Metropolis

The independent variable in this hypothesis is PowerPoint while the dependent variable is effective utilisation of PowerPoint (Low, Moderate, and high) in private secondary schools. To test this hypothesis, effective use of PowerPoint in private secondary schools in the Calabar metropolis from low, moderate, and high PowerPoints were compared using One-Way Analysis of Variance (ANOVA). The result of the analysis is presented in Table 1.

Table 1: Summary of data and one-way ANOVA of the effective utilisation of Power point (N=240)

Power point	N	\bar{x}	SD		
Low – 1	53	22.00	.00		
Moderate – 2	100	25.14	1.20		
High– 3	87	27.20	.75		
Total	240	25.40	1.89		
Source of variance	SS	Df	Ms	F	Sig of F
Between group	1259.887	2	629.944	1.391*	9.487
Within group	473.392	238	.976		
Total	1733.279	240			

*Significant at 0.05 level, critical F=3.00, df= 2, 258.

The result on Table 1 revealed that the calculated F-value of 1.391 is less than the critical F-value of 9.487 at 0.05 level of significance with 2 degree of freedom 238. With this result the null hypothesis was retained. This result therefore implied that, PowerPoint is not significantly used in instructional delivery in the private secondary schools.

Hypothesis two

WhatsApp is not effectively utilised in instructional delivery in private secondary schools in the Calabar Metropolis of Cross River State.

The independent variable in this hypothesis is WhatsApp while the dependent variable is effective utilisation (Low, Moderate, and high) in private secondary schools. To test this hypothesis, effective utilization of WhatsApp utilisation in private secondary schools from low, moderate, and high were compared using One-Way Analysis of Variance (ANOVA). The result of the analysis is presented in Table 2.

Table 2: Summary data and one-way ANOVA of the effective utilisation of WhatsApp in private secondary schools (N=240)

WhatsApp	N	\bar{X}	SD		
Low – 1	82	26.00	1.27		
Moderate – 2	99	24.50	1.86		
High– 3	59	27.51	0.50		
Total	240	25.40	1.89		
Source of variance	SS	df	Ms	F	Sig of F
Between group	558.033	2	279.016	115.144*	.000
Within group	1175.246	238	2.423		
Total	1733.279	240			

* Significant at 0.05 level, critical F=3.00, df= 2, 258

The result on Table 2 revealed that the calculated F-value of 115.144 is higher than the critical F-value of 3.00 at 0.05 level of significance with 2 and 238 degree of freedom. With this result the null hypothesis was rejected. This result therefore implied that, WhatsApp mediated instruction was effectively utilised in private secondary schools. Since WhatsApp had a significant effective utility in private secondary schools, a post hoc analysis was employed using Fishers’ Least Significant Difference (LSD) multiple comparison analysis. The result of the analysis is presented in Table 3

Table 3: Fishers’ Least Significant Difference (LSD) multiple comparison analysis of the effective utilization of WhatsApp in instructional delivery in private secondary schools LSD

(I) WhatsApp	(J) WhatsApp	Mean Difference (I-J)	Std. Error	Sig.
1.00	2.00	1.50000(*)	.15552	.000
	3.00	-1.50769(*)	.22835	.000
2.00	1.00	-1.50000(*)	.15552	.000
	3.00	-3.00769(*)	.21587	.000
3.00	1.00	1.50769(*)	.22835	.000
	2.00	3.00769(*)	.21587	.000

* The mean difference is significant at the 0.05 level.

The result of the analysis in Table 3 shows that teachers whose WhatsApp utilisation were low were significantly different in their instructional delivery from those whose WhatsApp utilization were either moderate or high. Also, teachers who were moderate in their WhatsApp utilization were significantly different from those who were high in their WhatsApp utilisation in private secondary schools.

Discussion of findings

The result of the first hypothesis indicated that, PowerPoint was not significantly utilised in mediating instructional delivery in private secondary schools in the Calabar metropolis. This is true because this needed private school owners to invest money on the purchase of the needed resources and equipment, and training of staff to acquire the required skills. This supports the observations of Amadi and Orji (2017) who noted that the problems associated with the PowerPoint programme included power or electricity challenge, teachers' fear of technology use, wrong choice of design, and many more.

During and shortly after the COVID-19 pandemic, school owners, teachers and all concerned made concerted efforts to provide any form of technological tool that could be relevant in the instructional process. As time passed, most private school owners became indifferent in providing any form of technology media facilities and equipment as a tool to enhance the instructional process and as a preparation against any future pandemic outbreak. Most schools gradually backpedaled to the traditional method of face-to-face teaching because of the financial implications to sustain the technological devices. Instructional processes were no longer technology mediated and may not be adjudged as technologically effective. Most teachers too were not conversant with the technologies of the moment as to maintain their utilization.

The result of the second hypothesis indicated that, WhatsApp significantly and effectively utilised in instructional delivery in private secondary schools. This should be true because teachers might have guided students who had smartphones to create groups where study materials were disseminated and shared. WhatsApp could be more effectively utilized because it easier and cheaper as compared to any other technology. Even students who cannot afford smart phones can work or learn using their friends' phones. The findings are in line with the view Maphosa et al (2020) who identified one feature that makes WhatsApp to be very useful among students worldwide is its ability to create groups within the application which allows users to collaborate on tasks and communicate from anywhere and at any time. Today, technology mediated instruction (with the use of the WhatsApp) continues to grow day by day at an incredible rate. WhatsApp is one of the changes in technology that is commonly used on specific mobile phones and computers. Nwaka (2024) also noted that WhatsApp was one of the most popular text and voice messaging apps that could send messages, make voice calls, and host video chats on both desktop and mobile devices.

Conclusion/Recommendations

Based on the results of the study it was concluded that instructional delivery in private secondary schools was not effectively mediated with technological devices except the WhatsApp which was the only technological tool utilised. Under this scenario, instructional delivery still had a high risk at any given time of any pandemic outbreak like the COVID-19 pandemic.

Based on the findings of this study, the following recommendations are made: Private school owners should provide the necessary technological equipment, and train staff on their usage as to enhance instructional delivery and prepare against any sudden pandemic which has become a recurring incidence in the world. School authorities and teachers should

continue to improve on the already utilised WhatsApp technology as this will be an established tool to aid instructional delivery at the time of pandemic disaster.

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