



**TEACHERS' EXPERIENCES IN THE INTEGRATION OF INTERACTIVE
ELEMENTS IN DIGITAL LESSONS IN MATHEMATICS:
BASIS FOR IN-SERVICE TRAINING**

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ABSTRACT

This qualitative study aimed to determine the teachers' experiences in the integration of interactive elements in digital lessons in mathematics as basis for in-service training. The research method utilized in the study was qualitative using in-depth interview and the design was phenomenology. It was discovered that the results were facilitating interactive learning, enjoyable learning encounter, motivating classroom atmosphere and meaningful learning experience. The challenges encountered on the use of interactive elements in digital lessons in mathematics, includes time management challenges, scarcity of teaching and learning resources, technical challenges and distractions. The opportunities encountered on the use of interactive elements in digital lessons in mathematics emphasized engaging learning experiences, learning made easy and improves academic performance

Keywords: *Interactive Elements, Digital Lessons, DepEd, Teachers, In-service training*

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INTRODUCTION

Background of the Study

Digital technology brought significant changes in the field of education with the integration of interactive elements in digital lessons. These interactive elements, such as multimedia presentations, virtual manipulatives (blocks, tiles, and other tangible visual materials), interactive exercises (games, quizzes, and activities) and collaborative tools (both online and offline tools), have the potential to bring massive changes in the teaching-learning process, particularly in the field of Mathematics. These interactive features and multimedia components, digital classes have become increasingly popular as powerful tools for captivating learners and boosting their learning experiences.

When asked about their Mathematics education, the majority of individuals would probably remember being instructed in rote memorization of mathematical ideas, where the teacher would illustrate the techniques for solving specific problems on the board (Chapko & Buchko, 2004). Digital lessons, on the other hand, provide a distinct opportunity to actively engage students and encourage deeper understanding and application of mathematical concepts.

Although various studies have already researched about the effectiveness of digital lessons in enhancing student engagement and knowledge retention, there is a need to delve deeper into the specific impact of interactive elements in Mathematics. It is imperative for

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educators and instructional designers to comprehend the impact of these factors in order to enhance the design and execution of digital classes.

The study aimed to examine the impact of interactive components in digital Mathematics lessons on students' academic achievements. The primary objective of this study is to investigate the efficacy of different interactive elements in augmenting students' level of engagement and comprehension of mathematical principles. By examining the impact of these elements, the study seeks to provide valuable insights into their role in supporting students' cognitive development in Mathematics education.

The study employed qualitative research methodologies to gain a comprehensive understanding of participants' experiences, allowing for a detailed exploration on the analysis between interactive aspects and learning outcomes. This research collected and analyzed data from teachers who have engaged with digital lessons featuring interactive elements, using interviews, focus groups, and document analysis. The aim of the research was to identify effective components that enhance learning by examining their perspectives, experiences, and instructional practices.

The results obtained from this study made a valuable contribution to the current corpus of study on educational technology and its impact on Mathematics instruction. The findings can give educators, instructional designers, and policymakers valuable information that can help them

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decide whether to include interactive features in digital classes to improve students' performances.

In conclusion, the growing prevalence of digital lessons in mathematics education presents an opportunity to revolutionize the way students engage with mathematical concepts. This research sought to shed light on the specific influence of interactive elements in digital lessons in mathematics, ultimately enhancing instructional practices and improving student outcomes.

MATERIALS AND METHODS

Research Methodology

This chapter presents the research method, research design, participants of the study, data-gathering procedures, research instrument, and data analysis used in this study. The purpose of the study was to analyze teachers' experiences in the integration of interactive elements in digital lessons in mathematics of secondary mathematics teachers as bases for the in-service training of the schools district of Cabatuan II.

Research Method

The research method utilized in this study was qualitative research semi-Structured Interviews, researchers design interview guides with open-ended questions to elicit participants' perspectives, experiences, and insights. The interviews were conducted either in person or online, depending on the participants' preferences.

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During the interview, the interviewer was asked interview questions to the interviewees about series of inquiries regarding specific issues. The goal was to obtain the main or necessary views of the participants in a specific issue in a social context through their responses to the questions.

Research Design

The study utilized a phenomenological research design, a philosophical framework commonly adopted in qualitative research design. Phenomenology aims to comprehend how individuals perceive the world and how their perspectives might differ from commonly accepted viewpoints. This is achieved by exploring a person's personal interpretations of their experiences. Phenomenological research involves interviewing participants to uncover their insights, and it finds frequent application in fields like psychology, sociology, and social work.

Smith (2013) defines phenomenology as the study of how consciousness is experienced from a subjective perspective. The essence of an experience is its intentionality, which indicates its inherent focus on something, since it represents an interaction with or connected to a certain entity. The alignment toward an object occurs through the combination of its content or significance (which symbolizes the object) alongside suitable facilitating conditions.

Participants of the Study

The participants of the study were the nine (9) secondary mathematics teachers teaching mathematics from the schools district of Cabatuan II for the school year 2023-2024.

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Total population was considered by the researcher since only few secondary teachers were teaching Mathematics in the schools district of Cabatuan II.

Sampling Design

The study utilized a purposive sampling design. Purposive sampling involves intentionally selecting individuals based on specific characteristics related to the research population and study objectives (Creswell & Creswell, 2018). This approach, also referred to as judgmental, selective, or subjective sampling, falls within the realm of non-probability sampling methods.

Research Instrument

The study employed a researcher-developed interview schedule as the research instrument.

The interview schedule consisted of three inquiries that centered on the objective of the investigation.

Data gathering and documentation were conducted using voice and video recorders, with the participants' permission.

Validity of the Research Instrument

Prior to determining the validity of the researcher's questionnaire-checklist, the items were submitted for review and modification by a panel of jurors chosen for their expertise in the fields of research, testing, and assessment, and English.

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The jurors assessed each item, revising, rejecting, or keeping it. All comments and suggestions for finalizing the research instrument were considered.

Validity encompasses the appropriateness, significance, accuracy, and practicality of the inferences drawn by a researcher. Specifically, in terms of content-related validity evidence, it is imperative that both the content and structure align harmoniously with the definitions of variables and the sample group under examination. This alignment significantly contributes to confirming the relevance of the questionnaire items (Fraenkel and Wallen, 2007).

Comments, revisions, and suggestions from the panel of validators regarding the interview schedule shall be evaluated using the appropriate Good and Scates form (Appendix A).

Data Gathering Procedures

Permission to conduct the study was obtained from the adviser, Dean of the Graduate School, Office of the Schools Division Superintendent, Office of the District Supervisors, School Heads, and individual participants. The researcher personally went to the schools/community/place convenient on the part of the participants to conduct the interview.

The researcher conducted an interview to the participants but prior to this, the researcher encouraged the participants first to sign a waiver or permission relative to the conduct of the study.

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An extensive interview was conducted, accompanied by a voice and video recorder to fully capture the interviewee's verbal expressions. After conducting a series of interviews, the researcher compiled all the gathered data.

Data Analysis

The collected information was examined utilizing a thematic approach.

One of the key components of thematic analysis is the identification of repeating patterns or themes within qualitative data. According to Maguire and Delahunt (2017), the purpose of thematic analysis is to identify important or interesting themes in the data. These themes are then used to investigate research questions or provide insight into specific situations. This involves the systematic procedure of condensing, examining, and evaluating the collected data, finally extracting significant insights from it.

RESULTS AND DISCUSSIONS

The study was conducted to determine teachers' experiences in the integration of interactive elements in digital lessons in mathematics as basis for in-service training, as perceived and experienced by secondary mathematics teachers in the schools district of Cabatuan II during the school year 2023-2024.

The research method utilized in this study was qualitative method using in-depth interview and the research design was phenomenology.

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The participants of the study were the 9 secondary mathematics teachers teaching mathematics from the schools district of Cabatuan II.

A researcher-made interview schedule was used as an instrument to gather data.

Voice and video recorder were also used for data gathering and documentation depending upon the permission of the participants.

The questionnaire underwent content-validation by the Panel of Experts. The Criteria for the Content Validation by Fraenkel and Wallen (2007) was used to determine the validity of the questions in the interview schedule. The researcher considered all comments and suggestions relative to the validation of the tool. After the questionnaire has been found valid, permits was prepared to allow the researcher to start conducting the in-depth interview.

Permits from the adviser, Dean of the Graduate School, Office of the Schools Division Superintendent, School Head, and individual participants were obtained to allow the researcher to conduct the study. The researcher personally went to the schools/community/place convenient on the part of the participants to conduct the interview.

The researcher consolidated all collected data after series of interviews. The information was gathered, analyzed, and interpreted using thematic approach.

The following are the findings of the study:

Based on the findings from in-depth interviews with teachers as to their experiences with the use of interactive elements in digital lessons in mathematics, the results revealed the following

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emerging themes which include facilitating interactive learning, enjoyable learning encounter, motivating classroom atmosphere, meaningful learning experience.

It was found out that the challenges encountered on the use of interactive elements in digital lessons in mathematics, include time management challenges, scarcity of teaching and learning resources, technical challenges and distractions

It was also found out based on the findings from in-depth interviews with teachers that the opportunities encountered on the use of interactive elements in digital lessons in mathematics were engaging learning experiences, learning made easy, and improves academic performance.

Based on the results of the study, the following insights were drawn:

The integration of integrative elements in digital mathematics lessons is vital for cultivating dynamic and effective learning experiences. By infusing interactive features into lessons, educators create engaging environments that encourage active student participation and foster a deeper understanding of mathematical concepts. Furthermore, this integration presents numerous opportunities for educators to enhance student engagement and comprehension. By leveraging these opportunities, educators can optimize learning experiences, ultimately leading to improved academic performance in mathematics.

However, several challenges impede the seamless integration of these elements. Time constraints often limit the opportunity for educators to fully develop and implement interactive materials within their lessons. Additionally, a lack of teaching and learning resources, including

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access to technology and educational materials, poses barriers to effective integration. Technical issues, such as software glitches or unreliable internet connections, further hinder the smooth implementation of interactive elements. Moreover, distractions in the learning environment can divert students' attention away from the interactive components, impacting their effectiveness.

The integration of interactive elements in digital mathematics lessons represents a pivotal step towards creating dynamic, engaging, and effective learning environments. Despite the challenges that may arise, educators can overcome these obstacles through strategic planning and technological support. By leveraging interactive elements, educators can enhance student engagement, foster deeper comprehension of mathematical concepts, and ultimately promote academic success in mathematics.

CONCLUSION

In the light of the findings and insights arrived in this study, the following recommendations were forwarded:

Teachers and other school personnel need to have rigid training-workshop on computer and technology to maximally utilize them in the classroom and in the teaching-learning process. Upgrading of school ICT equipment for teachers and students use and availability of these should be given high attention.

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Educational institutions should invest in providing adequate teaching and learning resources, including technology infrastructure and educational materials. This may involve securing funding for the acquisition of digital tools and resources, such as interactive software and multimedia resources, to support effective integration.

Provide in-service training sessions to educators specifically focusing on the integration of interactive elements in digital mathematics lessons. These training sessions can offer hands-on experience with digital tools, best practices for lesson planning, and collaborative discussions on overcoming implementation challenges.

Good relationship among the learners, teachers, and parents, including other stakeholders should be maintained and sustained by creating a program purposely for the institutionalization of good relationship in the school system.

Teachers should be innovative and creative in making use of scarce resources and availability of the latter in transferring and sharing the technology and knowledge to the learners.

Parents should be capacitated on how to extend support to their children at home and appreciated of the work done to sustain their interest and enthusiasm in supporting the school and their children's education.

A copy of the remediation and enrichment programs should be given to the Schools Division Office, Regional Office, and Central office for them to approve and implement.

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If a copy of this recommended remediation and enrichment programs would not be approved, school heads are encouraged to implement these in a local arrangement bases only.

A similar study is also encouraged to be conducted in the future and consider other variables not used nor mention in the study.



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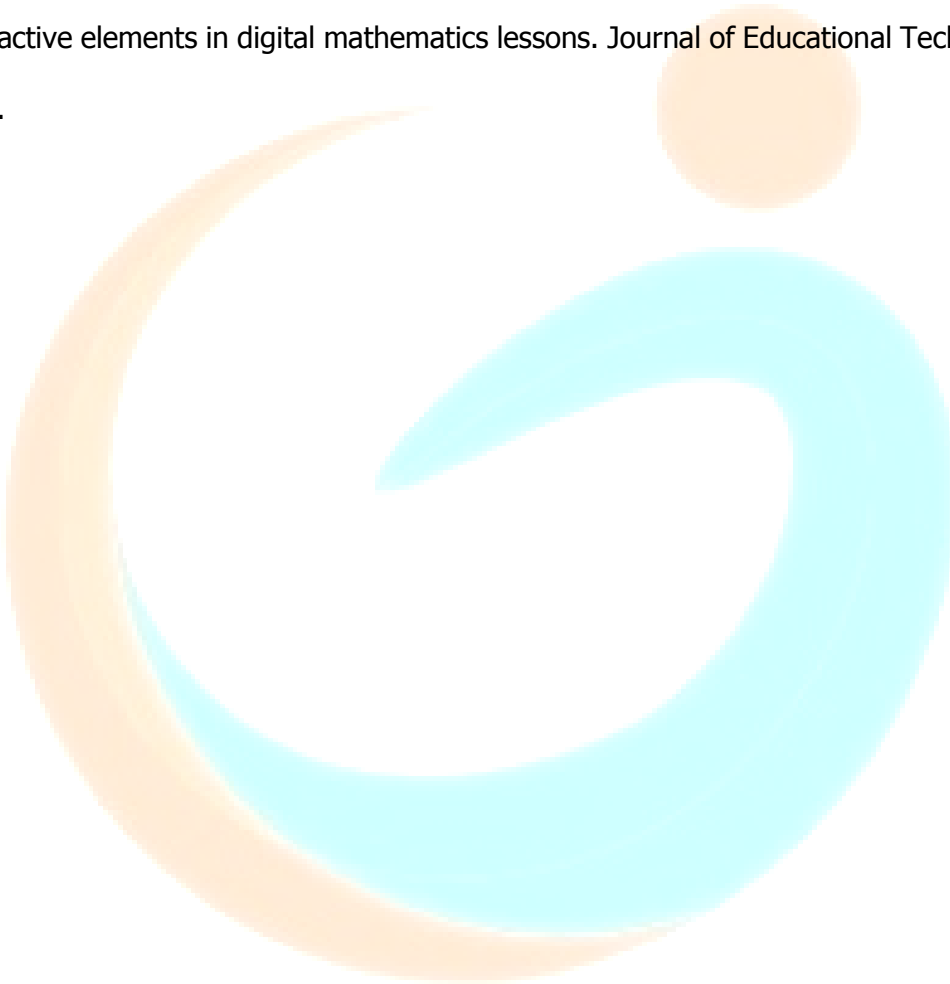
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