



EXPERIENCES IN LEARNING FOUR FUNDAMENTAL OPERATIONS IN MATHEMATICS: BASES FOR INTERVENTION PROGRAM

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ABSTRACT

The qualitative study using phenomenological research design aimed to know the experiences of Grade 8 teachers and learners in studying the four fundamental operations in Mathematics. Researcher-made interview guide was administered to sixteen participants. Thematic analysis was utilized for descriptive data analysis. Learners' experiences included easy understanding of numbers, difficulty in computing big numbers and improving Math skills. Teachers' experiences were lack of understanding and resources, lack of interest and no follow-up at home, good teaching strategy and lack of knowledge and skills. Challenges encountered by learners were difficulty in memorizing multiplication table, lack of interest and lack of motivation. Teachers' challenges were difficulty to grasp Math concepts, lack of time and mastery, and lack of interest. Learners managed challenges by giving more time to study and practice. Teachers' familiarized themselves with Math concepts, strong basic foundation and use of differentiated instruction. The challenges encountered were the bases in formulating the intervention program.

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Keywords: *Experiences, Four Fundamental Operations, Mathematics*

INTRODUCTION

Mathematics is an indispensable subject and it cannot be detached from humans' daily lives. Everything in life involves Mathematics that each one should appreciate and understand.

The study of Mathematics originated alongside with the development of human civilization. In the contemporary context, the significance of Mathematics is reflected in educational curricula and the overall emphasis on learning.

From elementary school to college, Mathematics is a fundamental component, aiming to cultivate logical, analytical, systematic, critical, and creative thinking skills, as well as the ability to collaborate with others. These competencies are crucial for individuals to process and apply information effectively, enabling them to navigate changing situations and conditions (Unaenah, 2018).

Encountering challenges in learning Mathematics is inherent in the learning process. Facing difficulties, learners may exhibit developmental differences compared to their peers, and these difficulties can be manifested in various forms. Both teachers and parents share the responsibility to assist learners in overcoming these challenges (Susanto, 2013).

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The educational journey is marked by a gradual progression from elementary with uncomplicated concepts to more intricate and sophisticated ideas. As learners navigate through their learning process. They move from foundational principles to more complex theories, gaining a deeper understanding of the subject matter. This sequential advancement is crucial in building comprehensive knowledge of learners. In this journey, learners engage in concrete experiences; followed by semi-concrete stages wherein they grasp concepts through illustrations; and finally, the abstract stage when learners use Mathematical symbols without relying on visual aids, as outlined by Abdurrahman (2012).

According to Mcber (2010), the advancement of learners is notably impacted by the caliber and efficacy of teachers, surpassing factors like classroom ambiance, school conditions, or student-related elements.

The Annual National Assessment Program, held in February 2011, indicated that on a national scale, learners attained an average of 35% in literacy and merely 28% in numeracy. Those outcomes were considered inadequate in both literacy and numeracy, with the underperformance attributed to learners' challenges in reading and writing with comprehension (Department of Education, 2011).

The primary aim of secondary-level Mathematics education is to equip learners with the skills to apply various Mathematical concepts in everyday life. The learning process follows a

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progression from simple to complex concepts. In the concrete stages, learners engage with tangible, real-world examples, followed by the semi-concrete stage where they learn through illustrations of Mathematical objects. The final stage involves learners using symbols of Mathematics without relying on visual aids, as outlined by Abdurrahman (2012).

As a teacher, the selection of the research problem was driven by the need to understand the experiences of Grade 8 teachers regarding learners' proficiency in the four fundamental operations in Mathematics. The inquiry was intended to address the functional numeracy of Grade 8 learners in which instructional strategies played a crucial role.

The outcomes of the study were the bases for suitable intervention programs for Ramon Avanceña National High School, Schools Division of Iloilo City, during the school year 2022-2023.

MATERIALS AND METHODS

Research Methodology

This chapter delineates the research design, research method, participants of the study, data collection procedure, research instruments, and data analysis utilized in this investigation.

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The primary objective of this study was to explore the experiences associated with learning the four fundamental operations in Mathematics among Grade 8 learners and teachers of Ramon Avanceña National High School, Schools Division of Iloilo.

The findings of the study aimed to inform the development of an intervention program during the academic year 2022-2023.

Research Design

This research employed a phenomenological research design. According to Creswell (2015), a phenomenological study delved into human experiences by providing detailed descriptions of the individuals under study. It sought to comprehend lived experiences and identified commonalities within a specific group. The primary objective of this approach was to generate a description of the nature of a particular phenomenon. In this study, a phenomenological method was employed to gain a profound understanding of the challenges faced by Grade 8 learners in learning Mathematics.

Furthermore, the data obtained from interviews were analyzed using qualitative content analysis or thematic analysis, based on individual responses. Thematic analysis, also known as comparative analysis, proved useful in identifying recurring themes (Wahyuni, 2012). While no qualitative research methodology software was utilized during the study, responses were meticulously analyzed, coded, cross-checked, and validated.

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Research Method

In this study, a qualitative research approach was employed, utilizing in-depth interviews as the primary data collection method. The interviews were conducted in a face-to-face setting, allowing both the interviewer and interviewee to sit together while contemplating a series of questions pertaining to a specific issue. The objective was to capture the essential perspectives of the participants within a social context through their responses to the given questions.

Participants of the Study

The participants in this study consisted of selected Grade 8 learners and teachers. The selection of participants was carried out through purposive sampling, targeting those learners who were officially enrolled in Grade 8 at Ramon Avanceña National High School, Schools Division of Iloilo City during the school year 2022-2023. The participants were chosen based on pre-existing information available.

It was acknowledged that the researcher might encounter inaccuracies or misjudgments in estimating the representativeness of the sample or their proficiency concerning the required information (Fraenkel & Wallen, 2007).

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Sampling Design

The study utilized a purposive sampling design, a non-probability sampling method chosen based on the characteristics of the population and the study's objectives. Also known as judgmental, selective, or subjective sampling, purposive sampling is a non-probability method where researchers use their judgment to select participants for their surveys. The researcher identified and selected participants who were particularly relevant and significantly involved in this study.

Research Instruments

The researcher-made interview guide was used during in-depth interviews to collect information from Grade 8 learners and teachers for this study. The interview guide specifically addressed the study's objectives. Video recording was utilized for data collection and documentation, depending upon the participants' consent. Thematic analysis was employed to condense the study's findings.

Validity of the Research Instrument

Validity refers to the degree to which a study accurately reflects or assesses the specific concept that the researcher is attempting to measure (Fraenkel & Wallen, 2007).

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After the researcher presented to her adviser the draft of the research instrument for corrections and suggestions, revisions were made. Three experts in the field of research validated the interview guide, which included questions aligned with the study's objectives. A thorough examination of question validity was conducted to ensure that the questions were appropriately formulated and adhered to ethical standards.

Validation criteria, such as alignment with research objectives and question clarity, were assessed by three experts within the field. Content validity was determined based on how well the measurement reflected the specific intended content domain (Carmines & Zeller, 2001).

Data Gathering Procedures

Approval to conduct the study was obtained from the thesis adviser, the Dean of the Graduate School, Schools Division Superintendent, Public Schools District Supervisor, and, ultimately, the school head of Ramon Avanceña National High School, Schools Division of Iloilo City.

Individual participant permits were secured to authorize the researcher to carry out the study. The researcher personally met with the participants at their convenience for face-to-face interviews. Before the interviews, participants were asked to sign a waiver or permission form related to the study.

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During the in-depth interviews, voice and video recorders were provided to comprehensively capture the interviewees' words and responses. Following a series of interviews, the participants and the researcher collectively reviewed all the data being gathered.

To uphold ethical standards, data from the study were treated with the utmost confidentiality and used solely for the study's intended purpose.

Data Analyses

The collected information was subjected to analysis using a thematic approach. Thematic Analysis, a qualitative data analysis method, was employed, typically suitable for scrutinizing textual data like interview transcripts. The researcher meticulously scrutinized the data to pinpoint recurrent themes or topics (Caufield, 2019).

According to Fraenkel and Wallen (2007), the researcher extracted what they deemed as pertinent statements from each participant's account of the phenomenon and subsequently organized those statements into themes. Those themes were then synthesized into a narrative description of the phenomenon.

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SUMMARY, INSIGHTS, AND RECOMMENDATIONS

This chapter intends to present the summary of the research study, the findings, conclusions drawn from the findings, and the recommendations arrived at by the researcher.

Summary

This qualitative research was conducted to determine the experiences in learning four fundamental operations in Mathematics as bases for intervention program in Ramon Avanceña National High School, Schools Division of Iloilo City during the school year 2022-2023.

The study employed a qualitative research method, utilizing in-depth interviews, and adopted a phenomenological research design.

The study included 8 Grade 8 learners and 8 Mathematics teachers, each representing one grade section along with their respective teacher advisers, making a total of 16 participants. The data collection employed a researcher-developed interview schedule, and for documentation, voice and video recorders were used with the participants' consent. Content validation of the questionnaire was conducted by a panel of experts, adhering to Fraenkel and Wallen's (2007) criteria for question validity. The researcher considered all feedback during the validation process, and upon validation, permits were secured to initiate the in-depth interviews.

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The researcher obtained permits from various authorities, including the adviser, dean of the Graduate School, Office of the Schools Division Superintendent, public schools district supervisor, school heads, and participants, to conduct the study. The researcher personally visited the school, community, or a convenient location for the participants to conduct series of interviews.

After conducting a series of interviews, the researcher compiled and organized all the collected data. The information was then analyzed and interpreted using a thematic approach.

Based on the in-depth interviews, the study's findings revealed that learners' experiences with the four fundamental operations in Mathematics included easy understanding of numbers, challenges in computing large numbers, and improvements in Math skills.

Based on the information gathered during in-depth interview, the experiences of teachers in teaching the four fundamental operations in Mathematics were lack of understanding and resources, lack of interest and no follow-up at home, good teaching strategy and encourage learners to learn.

Based on the information gathered during the interview the challenges encountered by the learners in learning the four fundamental operations in Math were difficulty in memorizing multiplication table, lack of interest in Math and lack of motivation on learners.

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Based on the information gathered during in-depth interview, the experiences of teachers in teaching the four fundamental operations in Mathematics were lack of understanding and resources, lack of interest and no follow-up at home, good teaching strategy and encourage learners to learn.

Based on the information gathered during in-depth interview, the learners managed the challenges encountered in four fundamental operations in Math by giving more time to study and practice, understanding the process well and memorizing the multiplication table.

Based on the information gathered, teachers managed the challenges encountered in teaching four fundamental operations in Mathematics through familiarization of Math concepts, strong basic foundation and use of differentiated instruction.

An intervention program was proposed to address challenges encountered by learners and teachers in the four fundamental operations in Mathematics as identified during the conduct of in-depth interview to the participants of the study.

Insights

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

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The researcher believed that Math has many benefits that many learners don't even realize. It can help learners to be more practical and sometimes beneficial in their everyday situations in life.

Teachers' experiences serve as their driving forces to maintain the quality of teaching among learners and drive them towards the goal of helping them to learn and familiarize the four fundamental operations in Mathematics.

Learners' experiences in learning Mathematics remain beneficial but a challenging one that gears towards the correct recognition of numbers. Learning is at best when you experience it and overcome it.

Mastery of teaching promotes a deeper understanding of Math by encouraging learners to think critically and solve problems independently.

During the initial stages of life, learners observe and investigate the Mathematical aspects of their surroundings. They engage in activities such as comparing quantities, identifying patterns, spatial navigation, and solving real-world problems, honing their proficiency in applying diverse Mathematical concepts on a daily basis.

Teachers' expertise is crucial for involving learners in purposeful and efficient Mathematical activities within the classroom, fostering the development of a profound comprehension of Mathematics.

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Recommendations

The following were the recommendations based on the results of the study.

School heads and teachers may help improve and sustain the level of learners' understanding the four fundamental operations in Mathematics.

The teachers may use a variety of teaching methods. This will help them teach learners with different learning styles.

Establishing communication and linkages among stakeholders is a tedious task for school personnel but doing so means seeking their input, feedback and collaboration to ensure that the plans will be properly implemented.

Seminars and trainings may be conducted within the school level to disseminate the information and the importance of teaching the four fundamental operations.

Teachers may continue guiding and coaching their learners especially during their vacant time.

Teachers may maintain equal consideration and treatment of learners regardless of their standing inside the classroom to sustain a good relationship with them.

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Similar studies may be conducted in other areas using different variables which are not included in the present study to discover more significant results that would broaden the concepts of learners in the four fundamental operations in Mathematics.



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