

IMPLEMENTATION OF INQUIRY-BASED LEARNING IN GRADE FIVE MATHEMATICS LEARNERS IN SANTA IGNACIA SOUTH DISTRICT

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Abstract

This study evaluated the implementation of inquiry-based learning for Grade Five mathematics learners in Santa Ignacia South District, SDO Tarlac Province. It examined the impact of IBL on students' understanding of mathematical concepts compared to traditional teaching approaches, its role in fostering critical thinking and problem-solving abilities, and the responses of students with diverse learning styles and multiple intelligences. Additionally, the study identified challenges encountered by teachers and proposed strategies to address these needs.

The research employed a descriptive and quantitative design, documenting the methods, activities, and resources utilized in IBL and capturing the experiences of teachers and students. A Five-Point Likert Scale assessed the impact of IBL on student understanding and the challenges faced by teachers, while frequency and percentage analyses determined how IBL supports critical thinking and accommodates various learning styles.

Key recommendations include incorporating IBL into the Grade Five mathematics curriculum to enhance understanding, engagement, and problem-solving skills. Santa Ignacia South District should integrate diverse instructional strategies to support a range of learning styles, particularly musical intelligence, and invest in professional development for teachers. Additional resources, materials, and strategies to manage large class sizes and address time constraints are essential for effective IBL implementation.

Keywords: Inquiry-based Learning, Mathematics, Grade Five, Critical Thinking, Problem-Solving, Learning Styles

Introduction

Traditional methods of teaching mathematics often rely on rote memorization and procedural fluency, potentially neglecting the development of deeper conceptual understanding and problem-solving skills. Inquiry-based learning, on the other hand, emphasizes student-centered exploration, questioning, and discovery, fostering critical thinking and a more profound engagement with mathematical concepts (Eisenmann et al., 2022). This study investigates the implementation of IBL in Grade Five mathematics classrooms within the Santa Ignacia South District, SDO Tarlac Province. By examining the impact of IBL on student understanding of mathematical concepts, exploring its role in fostering critical thinking and problem-solving abilities, investigating its responsiveness to diverse learning styles and multiple intelligences, and identifying the challenges encountered by teachers in implementing IBL, this research aims to provide valuable insights for educators, curriculum developers, and policymakers seeking to enhance mathematics education (Kristiana et al., 2022). The findings of this study will contribute to the growing body of knowledge on IBL and its potential to transform traditional mathematics instruction (Magpantay & Pasia, 2022).

A central focus of this study is the evaluation of the impact of IBL on student understanding of mathematical concepts. The research compares the performance of students learning through

IBL with those taught using traditional methods (Patero, 2023). Quantitative data, such as test scores, quiz results, and project grades, are collected to measure the effectiveness of IBL in promoting conceptual understanding.

Furthermore, this study explores the role of IBL in fostering critical thinking and problem-solving abilities among Grade Five mathematics learners. The research investigates how IBL encourages students to ask questions, formulate hypotheses, design experiments, analyze data, and draw conclusions (Magpantay & Pasia, 2022). By engaging in these higher-order thinking skills, students develop a deeper understanding of mathematical concepts and their application to real-world problems (Sulistiyo & Wijaya, 2020).

In addition to examining student understanding and cognitive skills, this study also investigates the responsiveness of IBL to diverse learning styles and multiple intelligences (Nurhajarurahmah, 2021). The research explores how IBL can be adapted to cater to the individual learning preferences and strengths of students (Rasmitadila et al., 2020). By providing opportunities for students to engage with mathematical concepts through various modalities, such as visual, auditory, and kinesthetic learning activities, IBL aims to create a more inclusive and engaging learning environment (Susanti et al., 2022).

Moreover, this study identifies the challenges encountered by teachers in implementing IBL in Grade Five mathematics classrooms. The research explores factors such as the need for professional development, the availability of appropriate resources and materials, the management of student-led inquiry, and the assessment of student learning in an IBL setting (Putri et al., 2021). By understanding these challenges, educators and policymakers can develop strategies to support teachers in effectively implementing IBL and maximizing its benefits for students (Wen et al., 2023). The study also proposes strategies to address these challenges, such as providing teachers with training on IBL pedagogy, developing curriculum materials that align with IBL principles, and creating supportive school environments that foster inquiry-based learning (Sulistiyo & Wijaya, 2020). The goal is to enhance the quality of mathematics education and empower students to become confident and capable mathematical thinkers.

Method

Research Design

This study employed a descriptive and quantitative research design to evaluate inquiry-based learning (IBL) implementation in Grade Five mathematics within the Santa Ignacia South District. The descriptive research design provides a detailed account of the current state of IBL practices in the district's Grade Five classrooms. This includes documenting the methods, activities, and resources employed in IBL and understanding teachers and students' experiences and perceptions.

Participants

The study participants comprised Grade Five students and their mathematics teachers from the Santa Ignacia South District, SDO Tarlac Province.

Instrumentation

The primary data collection tool for this study was a survey questionnaire designed to evaluate the implementation and impact of inquiry-based learning in Grade Five mathematics education. The questionnaire gathered detailed information from mathematics teachers, including their use of IBL strategies, the resources they employed, and their perceptions of the effectiveness of these methods. Additionally, the questionnaire assessed students' engagement, understanding, and attitudes toward mathematics before and after the introduction of IBL. This

allowed for a comprehensive analysis of the instructional practices and student outcomes associated with IBL implementation.

Data Analysis

The researcher used five-point likert scale to determine the impact of inquiry-based learning on Grade Five students' understanding of mathematical concepts compared to traditional teaching methods and challenges do teachers face in implementing inquiry-based learning in Grade Five mathematics classes in Santa Ignacia South District.

Frequency and percentage was used to determine the ways does inquiry-based learning support the development of critical thinking and problem-solving skills in Grade Five students of Santa Ignacia South District and responses of the learners with different learning styles and multiple intelligences using inquiry-based learning in Grade Five mathematics in Santa Ignacia South District.

Results

Impact Of Inquiry-Based Learning on Grade Five Students' Understanding of Mathematical Concepts Compared to Traditional Teaching Methods

The mean scores indicate that students experienced higher understanding, engagement, and skill development with IBL than traditional methods. Specifically, IBL yielded higher mean scores in areas such as understanding of mathematical concepts (4.1 vs. 3.2), engagement in learning activities (4.3 vs. 3.0), and ability to apply mathematical knowledge (4.2 vs. 3.1). These findings suggest that IBL is more effective in enhancing students' grasp of mathematics and their involvement in learning processes.

Responses Of the Learners with Different Learning Styles and Multiple Intelligences Using Inquiry-Based Learning In Grade Five Mathematics in Santa Ignacia South District

The data reveals that students with diverse learning styles and multiple intelligences responded positively to IBL in their Grade Five mathematics classes. Notably, students with interpersonal intelligence exhibit the highest positive response rate (83%), suggesting that IBL's collaborative nature resonates well with their social learning preferences. Similarly, students with logical-mathematical (80%), bodily-kinesthetic (77%), and spatial intelligence (75%) also demonstrate highly positive responses, indicating that IBL effectively engages these learners through hands-on, analytical, and visual activities. Conversely, students with musical intelligence show a lower positive response rate (58%), which may suggest that the IBL approach used in mathematics did not fully cater to their auditory and rhythmic learning preferences.

Challenges Teachers Face in Implementing Inquiry-Based Learning in Grade Five Mathematics Classes in Santa Ignacia South District

The survey results highlight several key challenges that teachers face in implementing IBL in Grade Five mathematics classes. The most significant challenges include teachers in the Santa Ignacia South District perceive "Insufficient Training and Professional Development" as the most significant challenge in implementing inquiry-based learning (IBL) in Grade Five mathematics, with a mean score of 4.2 on the five-point Likert scale. Many teachers need more training and professional development to adopt IBL strategies effectively. Following this, "Limited Resources and Materials" also presents a considerable challenge, with a mean score of 3.9, highlighting that teachers frequently struggle with inadequate teaching resources and materials necessary for IBL. "Time Constraints" and "Large Class Sizes" are notable challenges, with means of 3.7 and 3.5,

respectively, suggesting that teachers face difficulties managing their time and accommodating large student groups within the IBL framework.

Discussion

The findings of this study align with the existing body of research on the benefits of inquiry-based learning in mathematics education. The positive impact of IBL on students' understanding, engagement, and skill development echoes the conclusions drawn in previous studies, which have consistently demonstrated that IBL facilitates deeper, more meaningful learning compared to traditional, teacher-centered approaches. (Rahmantiwi & Rosnawati, 2018) (Levy et al., 2013)

The varied responses of learners with different learning styles and multiple intelligences highlight the versatility of IBL in catering to diverse student needs. This is consistent with the literature, which suggests that IBL's emphasis on hands-on activities, collaboration, and multiple representations of concepts can effectively engage learners with diverse learning preferences (Levy et al., 2013).

However, the challenges identified in this study, such as insufficient teacher training, limited resources, and time constraints, reflect the common barriers to IBL implementation reported in the existing research. Addressing these challenges through targeted professional development, resource provision, and administrative support will be crucial to facilitate the widespread adoption of IBL in mathematics classrooms.

In conclusion, this study provides empirical evidence that inquiry-based learning can significantly enhance Grade Five students' understanding of mathematical concepts, engagement in learning, and development of critical thinking and problem-solving skills in the Santa Ignacia South District. The findings underscore the need for continued support and investment in teacher training, resource allocation, and administrative policies to enable the successful implementation of IBL in mathematics education.

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