

The Effectiveness of Differentiated Instruction in Improving Math Achievement for Students with Diverse Learning Needs

¹Mary Ann Miral- Benecario

²Remigilda D. Gallardo (EdD)

Abstract:- This study presents the outcomes of a thematic analysis based on responses from participants, shedding light on effectiveness of differentiated instruction in improving math achievement for students with diverse learning needs. There were eight (8) teachers from Talomo District, Davao City who participated in the study. This study made use of a phenomenological approach to extract the ideas from the participants. The participants were purposely selected as representatives from the same district. The study identifies three core challenges teachers encounter, namely: grappling with diverse materials and resources in teaching, managing the classroom effectively, and providing varying levels of support to students with diverse learning needs. To address these challenges, teachers resort to two primary coping mechanisms: participating in professional learning communities (PLCs) and fostering increased parental involvement in the educational process. Furthermore, participants emphasize the importance of implementing advanced evaluation methods for educational improvement. In summary, this thematic analysis offers insights on the importance of implementing advanced evaluation methods for educational improvement. These findings hold significance for educational stakeholders seeking to better support teachers, promote collaboration, and enhance the educational experience for students. For principals and school heads, it is essential to foster receptiveness to the challenges faced by teachers in implementing differentiated instruction and the coping mechanisms they employ. Understanding these needs and struggles can guide school leaders in providing the necessary support, resources, and professional development opportunities.

Key words:- *Differentiated Instruction, Math Achievement, Diverse Learning Needs.*

I. INTRODUCTION

Mathematics is a fundamental human activity- a way of making sense of the world. Achievement in mathematics has caused deep concern in many countries over the years. It is a well shared struggle among students, regardless of age, understanding math and its principles. Oftentimes, we ask with annoyance, while solving a complex mathematical solution for a class activity- how will this make a difference on my future? Math anxiety or a fixed mindset can make it

difficult for students to approach math problems with confidence and can limit their ability to learn. Math requires a strong understanding of language, and students who are not fluent in the language of instruction may struggle to understand and apply math concepts.

While it might not make sense from a young learner's perspective, teachers strive hard to teach students math because math is an essential skill that is required in many aspects of daily life and future careers. From managing personal finances to pursuing careers in science, technology, engineering, and mathematics (STEM) fields, math is a fundamental part of our world. By teaching math effectively, teachers can equip their students with the skills and knowledge necessary to succeed in their future endeavors and become responsible and informed citizens who can contribute to society in meaningful ways.

This study, titled "The Effectiveness of Differentiated Instruction in Improving Math Achievement for Students with Diverse Learning Needs" aims to unravel the insights of teachers on differentiated instruction to teach math. This study also aims to identify the challenges that teachers faced and the interventions that are effective in mitigating these issues. With these, the teachers shall give insights based on their personal experience.

The study acknowledges the significance of differentiated instruction in boosting math achievement for students with varying learning needs. Therefore, it aims to offer insights and recommendations to improve strategies for enhancing student achievement.

Through qualitative research methods, including in-depth interviews and focus group discussions, the study collects teachers' experiences and observations on the effectiveness of differentiated instruction in supporting mathematical progress. The data gathered is analyzed using thematic analysis, emphasizing common experiences and frequently mentioned concepts by the participants.

The findings of this study have significant implications for both teachers and learners engaged in differentiated instruction aimed at improving math achievements. The insights gained can inform the development of training programs, teaching strategies, and resources, thereby enhancing teachers' ability to effectively educate students with diverse learning needs.

Furthermore, this study contributes to the existing body of knowledge on research and literature related to differentiated instruction in improving math achievement. By exploring the experiences of teachers who work with students with diverse learning needs, the study sheds light on the factors necessary for enhancing math achievement through differentiated learning.

In conclusion, this study aims to offer valuable insights into the concept of differentiated instruction to enhance the math achievements of learners with diverse learning needs. By understanding the experiences and challenges faced by teachers, this research seeks to contribute to the body of knowledge and the improvement of effective differentiated instructional strategies.

II. METHOD

Phenomenological Inquiry Design is a qualitative research design that is specifically tailored to understand a particular phenomenon or experience as it is lived by a specific group of individuals within a defined context. This approach is used in this study and is characterized by its focus on the subjective experiences, meanings, and interpretations of the participants, and it seeks to gather rich, detailed, and nuanced data about their experiences in differentiated instruction.

The research design employed in this study is a qualitative phenomenological design. Interviews were conducted with a group of individuals who have first-hand knowledge of an event, situation or experience. Through this process the researcher constructed the universal meaning of the event, situation or experiences and arrived at a more profound understanding of the phenomenon.

An effective interview session was conducted as the research instrument in this study. The interview was done at a local school in order to make sure it had an elevated level of accuracy and validity.

In this study all the data collected were carefully examined and thoughtfully analyzed. The researcher first described personal experiences with the phenomenon under study. The researcher began with full description of her own experience of the phenomenon. She developed a list of significant statements. She then finds statements about how individual was experiencing the topic, lists these significant statements as having equal worth, and works to develop a list of nonrepetitive, nonoverlapping, statements. The researcher took the significant statements and then grouped them into larger units of information, called “meaning units” or themes. She wrote a description of “what” the participants in the study experienced with the phenomenon. Next, she wrote a description of “how” the experience happened. This was called “structural description,” and the inquirer reflects on the setting and context in which the phenomenon was experienced. Finally, she wrote a composite description of the phenomenon incorporating both the textural and structural descriptions.

In conclusion, the research design used in this study is qualitative phenomenological research design. The research instrument is through conducting interviews. Data analysis thematic analysis and coding and decoding the answers from the interviews.

III. RESULTS AND DISCUSSIONS

The study's findings centered on the observations and first-hand experiences of primary school teachers in Davao City's Talomo District using differentiated teaching to raise math achievement. The teachers were interviewed in-depth to gather the findings, and a thematic content analysis technique was used throughout the data processing process.

The first theme that emerged from the data using different materials and resources. Using different materials and resources in teaching mathematics was observed to enhance student engagement, along with promoting a concrete understanding of abstract concepts, accommodating diverse learning styles, developing problem-solving skills, establishing connections between mathematics and real-life applications, facilitating multimodal learning, and increase cultural and contextual relevance.

The second theme identified was providing different levels of support. Participants of this study agree that providing different levels of support in teaching mathematics is essential for addressing diverse student needs, promoting differentiated instruction, building confidence and self-efficacy, facilitating the gradual release of responsibility, accommodating diverse learning needs, and addressing misconceptions and challenges. It creates an inclusive learning environment where all students can engage with and succeed in mathematics.

The third theme identified was having professional learning communities. Teachers engage in professional learning communities (PLCs) or collaborative groups with colleagues to discuss and share effective practices in differentiated mathematics instruction. PLCs provide a space for collaborative problem-solving, idea sharing, and mutual support.

The fourth theme was increased parental involvement. Increased parental involvement can greatly contribute to the improvement of mathematics education. Parents can provide valuable insights into their child's strengths, weaknesses, and learning preferences. By sharing information about their child's mathematical abilities and interests, parents can help teachers better understand each student's individual needs and tailor instruction accordingly.

Overall, the findings shed light on the struggles of teachers were identified as primarily encompassing three themes. The first theme was the challenge of using different materials and resources in teaching, which may involve finding and utilizing diverse instructional tools to enhance student engagement and understanding. The second theme

focused on classroom management difficulties, including maintaining a positive learning environment and effectively addressing behavioral challenges. The third theme pertained to the challenge of providing different levels of support to students with varying needs, such as adapting instruction for diverse learning abilities.

In terms of implications, the study suggests a desire to enhance the assessment and evaluation processes used in education to make them more effective, accurate, and informative. By implementing these improved evaluation methods, teachers can gather more meaningful data to inform their instructional decisions, address students' needs, and promote better learning outcomes.

Moreover, the findings of the thematic analysis shed light on the struggles faced by teachers, the coping mechanisms employed, and the participants' insights regarding the implementation of enhanced evaluation methods for educational improvement. These findings provide valuable insights for educational stakeholders to better support teachers, promote collaboration, and continuously enhance the educational experience for students.

In terms of future directions, the study suggests that the principals or school heads would be more receptive of challenges faced by teachers in implementing differentiated instruction and the coping mechanisms they employ. This information can help school leaders understand the needs and struggles of their teachers and guide them in providing necessary support, resources, and professional development opportunities. Moreover, it suggests that teachers would have a better sense of shared understanding and suggests coping mechanisms such as engaging in professional learning communities and increasing parental involvement. This study also suggests that the learners to be more proactive in managing their time and using diverse materials and resources, effective classroom management, and providing different levels of support. Lastly, the future researchers are suggested to conduct the same study in a different location.

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