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DEVELOPING THE ANALYTICAL SKILLS OF STUDENTS: EXPERIENCES OF GENERALIST TEACHERS

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ABSTRACT

This phenomenological inquiry explored the experiences of the teachers in developing analytical skills of students at San Roque District, Division of Davao City. I employed the qualitative – phenomenological study in exploring the experiences of the ten (10) participants of which primary instrument of data gathering was through in- depth interview. Results indicated that after analyzing the responses of the participants, the following were the emergent themes: establishment of analytical learning environment, thorough understanding of the subject, and enhancement of logical thinking. Furthermore, on the participants' coping mechanisms adopted, the emerging themes were utilizing different teaching strategies and intensifying analytical thinking activities. Finally, the themes that emerged with regard to their insights in developing the students' analytical skills were promote academic success of students, improve problem solving ability, and strengthen analytical skills in the curriculum. It implies that learners may become more self-assured and confident by developing their analytical thinking skills. Because of this approach to thinking about data, they are aware that the outcome is the product of a line of reasoning that generates genuine outcomes. Also, keep in mind that students do, in fact, learn from their errors, which is very important both in their personal and professional life. Additionally, analytical thinking consists mostly of analyzing data and information. Having these abilities will allow you to better analyze data and arrive at informed conclusions. In addition to fostering new patterns of introspection, contemplation, and investigation, the cultivation of critical thinking skills may propel students into really transformative educational adventures. Students who have honed these abilities are better equipped to critically analyze questions of authority and to advocate for systemic reform.

Keywords: analytical skills, generalist teachers, phenomenology, Davao City

1. INTRODUCTION

In the field of education, the diversity of student learning methods is crucial. As teachers, we observe that students employ various techniques to tackle mathematical problems. Some use algebraic or functional solutions, while others prefer visual or figurative approaches. This diversity in problem-solving strategies highlights the importance of recognizing and nurturing different cognitive skills in students (Huincahue, 2021).

Critical thinking and problem-solving are essential skills that educators aim to develop in students. Analytical thinking, in particular, plays a crucial role in situational understanding, fact-checking, and deconstructing information (Qolfathiriyus et al., 2019). It involves a thorough assessment of each logical step in decision-making and is a higher-order cognitive ability necessary for understanding abstract mathematical concepts (Sukmaningthias & Hadi, 2016).

Despite the importance of analytical thinking, students in various countries, including Indonesia and the Philippines, often struggle with developing these skills. Research shows that Indonesian students generally excel in memorization but lack strong analytical abilities (Yakub et al., 2021). Similarly, Filipino students perform poorly in mathematics, particularly in higher-order thinking skills (Artuz & Roble, 2021). This situation necessitates an investigation into the educational approaches that can enhance students' analytical thinking abilities and the challenges teachers face in implementing these approaches. The purpose of this study is to explore the experiences of teachers in developing students' analytical skills at San Roque District, Division of Davao City. The study aims to delve into the methods teachers use to enhance analytical thinking skills, the challenges they encounter, and how they overcome these challenges. Additionally, the study seeks to gather insights from teachers on the effectiveness of their approaches and explore other strategies to improve students' analytical skills.

Research Questions

This study seeks to answer the following research questions:

1. What are the experiences of teachers in developing learners' analytical skills?

2. How do the teachers cope with the challenges they encountered in developing learners' analytical skills?

3. What are the insights of teachers in enhancing learners' analytical skills?

Significance of the Study

The findings of this study will contribute to the existing body of knowledge on enhancing learners' analytical thinking skills. It will provide valuable information on the teaching methods used to improve these skills and the challenges faced by teachers. The study will benefit various stakeholders:

Department of Education: The results can inform the development of teacher improvement plans, including training and seminars to help teachers enhance students' analytical thinking skills.

School Administrators: The findings will emphasize the need for support systems for teachers, including training programs to develop their skills in fostering analytical thinking in students.

Teachers: The study will offer insights into effective teaching strategies and classroom practices that promote analytical thinking.

Students: The results will raise awareness among students about the importance of analytical thinking skills in mathematics and everyday life.

Parents: The study will highlight the role of parental support in enhancing children's analytical thinking skills.

Future Researchers: The findings will serve as a reference for future research on teaching challenges and strategies to improve students' analytical skills.

Definition of Terms

For clarity and understanding, the following terms are defined operationally:

Analytical Skills of Students in Mathematics: The ability to tackle complex issues by evaluating and organizing information, detecting patterns, and finding creative solutions, particularly in the context of San Roque District, Division of Davao City.

Analytical Skills of Students

Analytical thinking involves recognizing a problem, breaking it down into components, organizing information, and making informed decisions. Descartes' model of analytical thinking emphasizes understanding parts to comprehend the whole (Al-Hasnawi, 2021). Analytical thinking is crucial in the 21st century for problem-solving in both academic and real-life contexts (Perdana et al., 2019).

Bloom's Taxonomy ranks analysis among the top cognitive skills, involving the ability to break down information, understand relationships, and evaluate evidence (Elder & Paul, 2019). Analytical thinking is essential for interpreting mathematical problems, making judgments, and solving issues through logical reasoning (Choowong & Worapun, 2021).

Developing Analytical Skills

Promoting analytical thinking in students requires opportunities to practice and develop these skills in the classroom. Effective problem-solving necessitates proper analysis and representation of issues (Sukmaningthias & Hadi, 2016). Analytical thinking skills are crucial for processing information, distinguishing useful data, and fostering creativity (Yulina et al., 2019).

Higher Order Thinking Skills (HOTS), including analytical thinking, are essential for academic success. Active learning and critical reflection are vital for developing these skills (Brookhart, 2010). Textbooks and teaching materials play a significant role in promoting HOTS and improving student performance (Pratama & Retnawati, 2018).

Theoretical Lens

This study is framed by several theoretical perspectives:

Constructivism Theory: This theory emphasizes the importance of real-life experiences in educational development. It promotes reasoning, critical thinking, and self-regulation (Driscoll, 2005). Vygotsky's Zone of Proximal Development highlights the role of social interaction in developing higher-order thinking (Vygotsky, 1962, 1978).

Bloom’s Taxonomy: This taxonomy categorizes cognitive skills, with analysis involving making inferences, identifying patterns, and supporting conclusions with evidence (Kelly, 2019).

Mathematical Thinking Style (MTS) Theory: Developed by Borromeo Ferri, this theory explores individual preferences in understanding and reasoning about mathematical relationships (Huincahue et al., 2021).

These theoretical frameworks guide the investigation into teachers' strategies for enhancing analytical thinking skills, the challenges they face, and the insights they gain from their experiences.

2. METHOD

In this section, the essential components of the research methodology are presented, including the research design, research participants, ethical considerations, the role of the researcher, data collection, data analysis, and the trustworthiness of the study.

Philosophical Assumptions of the Study

As a qualitative researcher, I recognize the importance of incorporating relevant concepts and theories into my work. This study focuses on examining the experiences of teachers in the San Roque District, Division of Davao City, as they

work to improve students' analytical skills. The study is guided by several philosophical assumptions as outlined by Creswell (2015):

Ontology

Ontology pertains to the nature of reality. In this study, reality is seen as subjective and multi-dimensional. It is shaped by the perspectives of the participants, the researcher, and the readers. I rely heavily on the participants' voices, using substantial quotations and themes to reflect their views and diverse opinions accurately.

Epistemology

Epistemology concerns the nature of knowledge and understanding. In this study, knowledge is considered subjective and constructed through interaction with the participants. I incorporate participants' voices and interpretations, presenting their experiences and perspectives through detailed narratives.

Axiology

Axiology involves the role of values in research. In this study, I openly explore the values that shape the research narrative, integrating my perspective with those of the participants. The participants' information is highly valued as it forms the foundation for investigating teachers' experiences in developing students' analytical skills.

Rhetoric

Rhetoric refers to the language and style used in the research. I employ a personal and literary narrative, utilizing qualitative concepts such as credibility, transferability, dependability, and confirmability. This approach ensures the research is presented in a way that resonates with the readers and accurately reflects the participants' experiences.

Qualitative Assumptions

This study employs a phenomenological method, aiming to explore the lived experiences of teachers in enhancing students' analytical skills. According to Husserl (1970) and Gupeteo (2014), phenomenological inquiry focuses on understanding participants' perceptions and experiences without preconceived notions. This method allows for an in-depth examination of the teachers' experiences, coping strategies, and insights.

Research Design

The research design is qualitative, using a phenomenological approach to study the lived experiences of teachers in San Roque District, Division of Davao City. This design is appropriate for exploring how teachers enhance students' analytical skills and the challenges they face.

The data collection involved in-depth virtual interviews with ten teachers, ensuring comprehensive and detailed information. The data were analyzed using thematic analysis to identify key themes from the participants' experiences.

Research Participants

This phenomenological study involved ten teachers from San Roque District, Division of Davao City. Participants were selected using purposive sampling, ensuring a diverse range of experiences and perspectives. The criteria for selecting participants included:

- Holding a permanent position as at least a Teacher I in public elementary schools.
- Assigned as grade school generalist teachers.
- Experienced in enhancing students' analytical skills.
- Comprising both male and female teachers.
- Not members of any ethnic minority or Indigenous People (IP) group.
- Willing to participate in the study.

Ethical Considerations

Ethical considerations are paramount in this study, adhering to the principles of respect for persons, beneficence, and justice as outlined in the Belmont Report (1979).

Respect for Persons

Participants were treated as autonomous individuals capable of making informed decisions. They provided informed consent, were assured of their confidentiality, and had the freedom to withdraw from the study at any time.

Beneficence

Beneficence involved protecting participants' well-being and ensuring the benefits of the study outweighed any potential risks. Participants were informed about the study's findings and how it would contribute to educational practices.

Justice

Justice ensured equitable treatment of all participants. Participants were selected impartially, and their involvement was voluntary. They were also compensated for their participation in the virtual interviews.

Role of the Researcher

As the primary data collector, my roles included interviewer, observer, transcriber, and data analyst. I ensured ethical rigor, established trust with participants, and maintained the confidentiality of their information. I facilitated the interviews, recorded and transcribed the data, and analyzed the responses to identify key themes.

Data Collection

Data were collected through in-depth virtual interviews, adhering to the IATF standards to ensure safety. Participants were selected using purposive sampling, and consent was obtained before the interviews. The interviews were recorded, transcribed, and analyzed to ensure accurate data collection.

Data Analysis

Data analysis involved several stages, including data recording, coding, and thematic analysis. Key steps included:

1. Familiarizing with the data.
2. Generating initial codes.
3. Searching for themes.
4. Reviewing themes.
5. Defining and naming themes.
6. Writing the report.

Environmental triangulation was used to consider the impact of different settings on the data. This approach ensured the validity and reliability of the findings.

Analytical Framework

The analytical framework followed Braun and Clarke's (2006) thematic analysis, which includes six phases: familiarizing with the data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and writing the report. This framework provided a systematic approach to analyzing the data and identifying key themes.

Trustworthiness of the Study

To ensure the trustworthiness of the study, the principles of credibility, transferability, dependability, and confirmability were applied.

Credibility

Credibility was ensured by using established procedures, in-depth interviews, and ethical standards. Member checking, iterative questioning, and data triangulation were employed to enhance reliability.

Transferability

Transferability was achieved by providing detailed contextual information, allowing future researchers to apply the findings to different settings.

Dependability

Dependability involved ensuring consistency and reproducibility of the study's outcomes. Detailed descriptions of the methodology and findings were provided to facilitate understanding and transferability.

Confirmability

Confirmability was established by focusing on the participants' meanings and creating an audit trail to track the research process. This ensured the findings were objective and supported by the data.

3. RESULTS

The purpose of this study was to explore the experiences of teachers in developing the analytical skills of students in the San Roque District, Division of Davao City.

Additionally, the study aimed to delve into the approaches teachers used to enhance analytical thinking skills in mathematics, the challenges they faced, and how they overcame these challenges. Insights from teachers on the effectiveness of these approaches and other strategies for enhancing students' analytical skills were also investigated.

Experiences of Teachers in Developing Learners' Analytical Skills

Establishment of Analytical Learning Environment

Creating an analytical learning environment is crucial for developing students' analytical skills. Effective learning environments provide students with the tools they need to advance academically and professionally.

IDI-02 stated:

"Great teachers design collaborative classrooms to cultivate a sense of community among their students. When a classroom exudes tenderness, attractiveness, and promotes harmony, students quickly acquire knowledge. Students learn most effectively in environments that permit movement, provide access to learning aids, and foster critical and creative thinking."

IDI-03 added:

"To ensure that content standards are met, a teacher must consider how to accommodate various modalities of instruction. Providing for those who learn best by speaking (oral), listening (aural), touching (tactile), or seeing can challenge even the most skilled instructors. In addition, educators must consider how learning styles of children can be stimulated within the classroom setting."

IDI-09 confirmed:

"There are instances when a teacher wishes to emphasize particular learning concepts or the curriculum's central theme. I've used problem-solving, role-playing, special guests, and other inventive techniques to attract students' attention and improve their retention of information. It is enjoyable for me and the students to provide a creative learning environment that deviates from the norm."

Research supports the idea that a conducive classroom environment is essential for fostering analytical thinking. Budsankom et al. (2015) and Elder & Paul (2019) emphasize the importance of systemic thinking activities in promoting analytical skills.

Thorough Understanding of the Subject

A deep understanding of the subject matter is vital for developing analytical skills. Teachers need to ensure students grasp the foundational concepts and their interconnections.

IDI-04 commented:

"It is instruction that is not necessarily concerned with real comprehension of the material, but rather with maximizing possible exam marks. This may necessitate focusing narrowly on the exam's subject matter and disregarding related material. It may involve prioritizing memorization over analysis. It may involve a preoccupation with the exam's format rather than the subject matter."

IDI-05 noted:

"Teaching someone else is a time-honored method of determining whether or not one has truly mastered a topic. Often, it is only when you must explain something that you realize you do not comprehend it as well as you believed."

IDI-10 mentioned:

"Just spend an hour or two explaining your notes or the focus of a few of your classes, and that should be sufficient. Ultimately, if you're explaining something to someone who won't be taking the exam, their learning from you is a benefit, not a requirement."

Analytical thinking involves breaking down complex problems into smaller parts, as highlighted by Al-Hasnawi (2021) and Atiya (2015). Understanding the properties of parts leads to a complete understanding of the subject, facilitating the development of analytical skills.

Enhancement of Logical Thinking

Logical thinking skills are crucial for problem-solving, decision-making, and generating creative ideas.

IDI-04 explained:

"The capacity to think systematically or to ground important conclusions in evidence and facts is what we mean when we talk about logical thinking. Using logic in one's analysis of a problem and subsequent creation of a solution is at the heart of this procedure."

IDI-05 shared:

"In order for students to understand and grasp procedures, they may need to see several demonstrations and examples throughout their lives. However, since problem-solving needs the use of thinking and analysis, methods that include protracted and frequent demonstrations are ineffective."

IDI-08 stated:

"The students consider all the various outcomes that may occur and examine the available choices in order to make selections that would hopefully lead to positive results."

Analytical thinking is crucial for situational understanding, fact-checking, and deconstructing information, as noted by Amer (2005) and Khusna (2020). Higher-order thinking skills (HOTS) further enhance logical reasoning and problem-solving abilities, enabling students to tackle complex issues effectively.

Coping Mechanisms of Teachers in Developing Learners' Analytical Skills

Utilizing Different Teaching Strategies

Effective teaching strategies are essential for improving students' comprehension and analytical skills.

IDI-01 highlighted:

"You may need to provide students with opportunities to expand their prior knowledge and vocabulary in order to support this initial level of comprehension in mathematics problem-solving activities."

IDI-06 emphasized:

"Involving students in the undertaking is a simple and time-efficient method to expand students' prior knowledge."

IDI-07 added:

"Invite students to collaborate by discussing an instructional text with a companion after they have practiced a strategy under your supervision."

IDI-08 mentioned:

"When knowledge is presented in the form of examples and tales that represent its practical relevance, it is much simpler to recall."

Teachers need to acknowledge various learning styles and preferences, as highlighted by Huincahue (2021) and Entwistle (n.d.). Incorporating different teaching strategies helps cater to diverse student needs and enhances analytical thinking skills.

Intensifying Analytical Thinking Activities

Engaging students in critical thinking activities is essential for developing analytical skills.

IDI-01 stated:

"There is a distinction between learning and memorization. This distinction is critical reasoning."

IDI-03 commented:

"Teachers must pose provocative questions. Students are frequently reluctant to pose inquiries in the classroom."

IDI-09 conveyed:

"Students can develop their critical thinking abilities through social experiences."

IDI-10 added:

"Allow students to engage in active learning if you want them to retain what they've learned through comprehension."

Analytical thinking involves assessing each logical step in decision-making, as noted by Sukmaningthias & Hadi (2016). Activities that require in-depth content analysis and creative application of knowledge are crucial for developing higher-order thinking skills.

Insights of Teachers in Enhancing Learners' Analytical Skills Promote Academic Success of Students Analytical reasoning is essential for academic success and personal development.

IDI-03 explained:

"The ability to think critically improves one's language, presenting abilities, and mathematical skills."

IDI-06 noted:

"Critical thinking is a talent that is beneficial for students to acquire since it can be used in a variety of contexts."

IDI-08 added:

"To develop a creative solution to a problem requires more than simply having novel concepts."

Analytical thinking is closely connected to academic success, as highlighted by Parta (2016) and Taleb (2016). Developing critical thinking skills improves students' comprehension and problem-solving abilities, leading to better academic performance.

Improve Problem Solving Ability

Effective problem-solving involves breaking down problems into manageable components and finding efficient strategies.

IDI-01 stated:

"The next stage in problem-solving is the ability to break down the problem into little pieces."

IDI-05 commented:

"Finding potential solutions is a difficult stage in the problem-solving process."

IDI-09 mentioned:

"Problem-solving concludes with a step-by-step execution strategy and decisive action."

Analytical thinking is essential for problem-solving, as noted by Perdana et al. (2019) and Choowong & Worapun (2021). Developing these skills enables students to tackle complex problems effectively.

Strengthen Analytical Skills in the Curriculum

Integrating analytical skills into the curriculum is crucial for developing students' critical thinking abilities.

IDI-04 expressed:

"There is a strong correlation between the character of one's reasoning and the quality of his or her life."

IDI-07 stressed:

"In mathematics, the ability to integrate cognitive processes, design solutions, and come to a conclusion via the use of analytical thinking is essential."

IDI-10 added

"Students' analytical reasoning skills improve over time, and as a result, they utilize mathematical representations more effectively."

Developing analytical skills requires a curriculum that promotes higher-order thinking abilities, as highlighted by Yurt (2022) and Cresswell & Speelman (2020). Integrating critical thinking activities into the curriculum helps students develop essential problem-solving skills.

4. DISCUSSIONS

In this part, the summary of the study is presented. From the summary of findings, implications for future directions are drawn.

Summary of the Study

The purpose of this study was to explore the experiences of teachers in developing the analytical skills of students in mathematics at San Roque District, Division of Davao City. Additionally, the study aimed to delve into the approaches teachers used to enhance analytical thinking skills in mathematics, the challenges they faced, and how they overcame these challenges. Insights from teachers on the effectiveness of these approaches and other strategies for enhancing students' analytical skills were also investigated.

A qualitative-phenomenological approach and a theme-based technique were used to accomplish the study. Following Creswell's (2006) guidelines, "open-ended" questions were asked during interviews to gain comprehensive insights into the participants' experiences.

Results indicated the emergence of the following themes: establishment of an analytical learning environment, thorough understanding of the subject, and enhancement of logical thinking. For coping mechanisms, themes included utilizing different teaching strategies and intensifying analytical thinking activities. Finally, the themes for insights in developing students' analytical skills in mathematics were promoting academic success, improving problem-solving ability, and strengthening analytical skills in the curriculum.

Implications

From the analysis and discussion of the study's results, several implications were drawn:

1. Enhanced Self-Confidence and Assurance in Learners: Developing analytical thinking skills can significantly boost students' self-assurance and confidence. This approach to data allows them to understand that outcomes result from a reasoned process, which is crucial in both personal and professional life. Recognizing and learning from their errors is a vital aspect of their growth.
2. Critical Analysis of Data and Information: Analytical thinking primarily involves the ability to analyze data and information critically. Students equipped with these skills can make informed decisions, fostering a new pattern of introspection, contemplation, and investigation. These skills propel students into transformative educational experiences, enabling them to critically analyze authority and advocate for systemic reform.
3. Practical Applications of Analytical Thinking: Analytical thinking is valuable in career and personal life. Through systematic methods like trial and error, reasonable conclusions can be reached. Individuals with strong analytical thinking can swiftly assess scenarios, issues, or problems and collaborate effectively to achieve results.
4. Understanding Causes and Consequences: A key aspect of analytical thought is understanding how to deduce causes and consequences. Predicting potential outcomes and exploring the relevance of new concepts to the original issue are essential parts of this approach. This typically involves recognizing a problem, collecting data, formulating and testing a strategy, and reflecting on the results.

Future Directions of the Study

1. Enhancing Analytical Thinking for the 21st Century: Analytical thinking is crucial for students' employment and daily lives in the 21st century. It involves inquiry and problem-solving in situations with less-defined parameters and outcomes. This skill is essential for equipping students with the necessary skills for a complex life and work environment. Analytical thinking involves breaking down problems, explaining systems, comparing and contrasting elements, and evaluating and critiquing qualities.
2. Implementing Analysis-Based Student Projects: Students can improve their analytical skills by participating in analysis-based projects. Starting with a clear framework, focusing on relevant analytical skills, practicing regularly, identifying helpful tools, and seeking feedback are essential steps.
3. Engaging School Principals and Education Leaders: School principals and other education leaders play a critical role in enhancing students' analytical skills. By involving teachers, parents, students, and others in the vision-creation process and supporting instructional efforts, leaders can help improve analytical thinking in students. Principals are responsible for fostering a positive school climate, implementing reforms, and overseeing daily activities and initiatives to ensure student achievement.
4. Using Focus Group Discussions for Data Collection: To gain more accurate findings on the practices of mathematics teachers in developing students' analytical skills, focus group discussions (FGDs) could be used as a data-gathering strategy. FGDs may provide more valid and reliable research findings about the topic.

In conclusion, the study highlights the importance of creating an analytical learning environment, utilizing diverse teaching strategies, and intensifying analytical thinking activities to enhance students' analytical skills. Insights from teachers emphasize the need to promote academic success, improve problem-solving abilities, and strengthen analytical skills in the curriculum. These findings provide valuable information for improving teaching practices and enhancing students' analytical skills in mathematics.

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