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RESEARCH ARTICLE

Pedagogical Strategies and Teachers' Instructional Experiences in Teaching Early Numeracy Skills in Public Elementary Schools of Maddela II District, Schools Division of Quirino

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Abstract

Early numeracy skills serve as foundational competencies that significantly influence learners' future mathematical understanding, academic achievement, and problem-solving abilities. Teachers play a crucial role in developing these foundational skills through appropriate pedagogical strategies, learner-centered instruction, and contextualized classroom practices. This qualitative phenomenological study explored the pedagogical strategies and instructional experiences of teachers in teaching early numeracy skills in public elementary schools of Maddela II District, Schools Division of Quirino. Specifically, the study examined teachers' instructional practices, classroom experiences, challenges encountered, coping mechanisms, and professional perspectives in teaching early numeracy among primary learners. Twelve public elementary school teachers handling Kindergarten to Grade 3 Mathematics classes were purposively selected as participants. Data were gathered through semi-structured interviews, classroom observations, and document analysis of lesson plans and instructional materials. Braun and Clarke's thematic analysis framework was utilized in analyzing the collected data. Findings revealed that teachers employed contextualized, manipulative-based, and learner-centered pedagogical approaches to enhance learners' numeracy development. Participants utilized games, visual aids, collaborative activities, concrete learning materials, and differentiated instruction to facilitate mathematical understanding and learner engagement. However, teachers also encountered challenges related to learners' varied abilities, insufficient instructional materials, parental support limitations, and time constraints in addressing foundational numeracy gaps. Despite these difficulties, teachers demonstrated adaptability, instructional creativity, and professional commitment through remediation activities, peer collaboration, and continuous pedagogical improvement. The study concluded that effective early numeracy instruction requires strengthened institutional support, contextualized instructional resources, parental involvement, and continuous teacher professional development programs. The findings contribute to the growing discourse on foundational Mathematics education and early childhood pedagogy in Philippine elementary schools.

Keywords: early numeracy skills, pedagogical strategies, instructional experiences, Mathematics education, elementary education, qualitative research, learner-centered instruction, public elementary schools

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INTRODUCTION

Early numeracy skills are essential foundational competencies that influence learners' future academic performance, mathematical reasoning, and problem-solving abilities. Numeracy development during the early years of schooling plays a critical role in helping learners understand numbers, patterns, measurement, quantity relationships, and basic mathematical operations. These foundational skills serve as building blocks for higher-level mathematical concepts and are closely associated with learners' cognitive development and academic success. In elementary education, teachers play a significant role in shaping learners' early numeracy experiences through effective instructional strategies, classroom interaction, and contextualized teaching practices.

In the Philippine educational system, the Department of Education emphasizes the importance of strengthening foundational literacy and numeracy skills through learner-centered and developmentally appropriate instruction. The MATATAG Curriculum and other educational reforms highlight the need to improve learners' numeracy competencies, particularly among early-grade learners who continue to experience difficulties in mastering basic mathematical concepts. Teachers are encouraged to utilize innovative, contextualized, and engaging pedagogical strategies that support active learning, conceptual understanding, and positive attitudes toward Mathematics.

However, despite curriculum reforms and instructional initiatives, many public elementary school teachers continue to encounter challenges in teaching early numeracy skills. Learners often exhibit varied levels of readiness, comprehension, and mathematical ability, making classroom instruction more complex and demanding. Teachers also experience difficulties related to insufficient instructional materials, overcrowded classrooms, limited parental involvement, and inadequate intervention programs for struggling learners. In geographically and socioeconomically diverse communities, these challenges become more evident, requiring teachers to demonstrate adaptability, creativity, and pedagogical responsiveness.

Previous studies emphasized that effective early numeracy instruction depends largely on teachers' pedagogical competence, classroom strategies, and understanding of child development principles (Clements & Sarama, 2020). Similarly, Piaget's Cognitive Development Theory explains that young learners acquire mathematical understanding more effectively through concrete experiences, manipulation of objects, and active exploration. Vygotsky's Social Constructivist Theory further emphasizes the importance of guided learning, social interaction, and collaborative activities in developing learners' conceptual understanding.

Despite the growing recognition of early numeracy education, limited qualitative studies specifically examine teachers' lived instructional experiences and pedagogical practices in teaching early numeracy skills in Philippine public elementary school contexts. Most existing studies focus primarily on learner achievement and quantitative assessments of numeracy performance, leaving a gap in understanding teachers' actual classroom experiences, challenges, and instructional adaptations.

Hence, this study aimed to explore the pedagogical strategies and instructional experiences of teachers in teaching early numeracy skills in public elementary schools of Maddela II District, Schools Division of Quirino. Specifically, the study investigated teachers' instructional approaches, classroom experiences, challenges encountered, coping mechanisms, and recommendations for improving early numeracy instruction. The findings of the study are expected to contribute to curriculum enhancement, teacher professional development programs, and instructional support initiatives that strengthen foundational Mathematics education in Philippine elementary schools.

Research Questions

This study sought to answer the following questions:

1. What pedagogical strategies do teachers utilize in teaching early numeracy skills in public elementary schools?
2. What instructional experiences do teachers encounter in teaching early numeracy among primary learners?
3. What challenges do teachers experience in developing learners' early numeracy skills?
4. How do teachers address instructional difficulties and diverse learner needs in early numeracy instruction?
5. What recommendations may be proposed to strengthen early numeracy instruction in public elementary schools?

METHODOLOGY

This study utilized a qualitative phenomenological research design to explore the pedagogical strategies and instructional experiences of teachers in teaching early numeracy skills in public elementary schools. The phenomenological approach was appropriate because it enabled the researcher to understand teachers' lived experiences, instructional realities, and pedagogical perspectives regarding early numeracy instruction among primary learners. The study was conducted in selected public elementary schools in Maddela II District, Schools Division of Quirino. The locale was selected due to its diverse learner populations and active implementation of foundational Mathematics instruction among early-grade learners. The participants consisted of twelve public elementary school teachers handling Kindergarten to Grade 3 Mathematics classes selected through purposive sampling. Participants were included based on the following criteria: currently teaching early-grade Mathematics subjects, possessing at least three years of teaching experience, and directly involved in early numeracy instruction. Data were gathered through semi-structured interviews, classroom observations, and document analysis of lesson plans, instructional materials, and assessment tools. Interviews were audio-recorded with participants' consent and transcribed verbatim for analysis. The study employed Braun and Clarke's (2006) thematic analysis framework involving data familiarization, coding, theme generation, theme review, and interpretation. To ensure the trustworthiness of the study, credibility was established through member checking and triangulation of data sources, while dependability was strengthened through audit trails. Confirmability and transferability were further ensured through reflective journaling and thick descriptions of the participants' classroom experiences and instructional contexts.

Results and Findings

Theme 1: Manipulative-Based and Contextualized Numeracy Instruction

The findings revealed that teachers utilized manipulative-based, contextualized, and learner-centered instructional strategies to facilitate learners' understanding of basic numeracy concepts. Participants emphasized the importance of using concrete objects, visual aids, games, counting materials, and localized examples in teaching early numeracy skills.

One participant shared:

"Mas natututo ang mga bata kapag may konkretong bagay silang nahahawakan at nakikita."

Another teacher explained:

"Ginagamit namin ang mga bagay na makikita sa komunidad para mas maintindihan nila ang bilang at basic operations."

A participant also stated:

"Kapag ginagamitan ng games at colorful materials, mas nagiging interesado sila sa Math."

Teachers frequently integrated counting activities, storytelling, songs, group games, and hands-on learning experiences to sustain learner engagement and participation. Classroom observations showed that learners became more active and responsive during manipulative-based activities and collaborative learning tasks.

The findings suggest that experiential and concrete learning experiences significantly support young learners' numeracy development. These findings align with Piaget's Cognitive Development Theory, which explains that young learners understand mathematical concepts more effectively through concrete operational experiences. Similarly, Clements and Sarama (2020) emphasized that manipulative-based instruction strengthens conceptual understanding and foundational numeracy competencies among early learners

Theme 2: Challenges in Addressing Diverse Learner Needs and Foundational Gaps

Despite teachers' positive instructional practices, participants encountered challenges related to learners' varied readiness levels, limited attention spans, weak foundational skills, and insufficient parental support. Teachers expressed concerns regarding learners who struggled with number recognition, counting, sequencing, and basic operations.

One participant explained:

"May mga batang hirap pa rin sa basic counting kaya kailangan talaga ng extra attention."

Another teacher shared:

"Iba-iba ang pacing ng mga bata kaya mahirap minsan pagsabayin ang kanilang learning."

A participant also stated:

"Kapag kulang ang suporta sa bahay, mas nahihirapan ang bata sa numeracy activities."

Teachers also identified insufficient instructional materials, large class sizes, and limited intervention time as additional barriers to effective early numeracy instruction. Some participants noted that remediation activities often required additional preparation and extended instructional effort.

The findings indicate that diverse learner needs and limited home support significantly affect the development of foundational numeracy skills. These findings support Vygotsky's Social Constructivist Theory, which emphasizes the importance of guided learning and social support in cognitive development. The findings also align with OECD (2019), which highlighted that foundational learning gaps are influenced by both school-based and home-based learning conditions.

Theme 3: Teacher Adaptability, Remediation Practices, and Professional Commitment

The findings further revealed that teachers demonstrated adaptability, creativity, and professional commitment in addressing learners' numeracy difficulties. Participants utilized differentiated instruction, remediation activities, peer tutoring, and individualized learning support to help struggling learners improve their numeracy competencies.

One teacher shared:

"Nagbibigay kami ng remediation at one-on-one activities para matulungan ang mga batang nahihirapan."

Another participant explained:

"Malaking tulong ang collaboration ng teachers sa paggawa ng instructional materials."

A participant also emphasized:

"Patuloy kaming naghahanap ng strategies para mas maging enjoyable at effective ang pagtuturo ng numeracy."

Teachers also participated in Learning Action Cell (LAC) sessions, peer mentoring, and professional development seminars to improve their pedagogical competence and instructional strategies in Mathematics education.

The findings demonstrate that teacher adaptability and professional collaboration significantly contribute to effective early numeracy instruction. Teachers' willingness to continuously improve their practices reflects their commitment to learner success despite instructional constraints. These findings support Darling-Hammond et al. (2020), who emphasized that collaborative professional learning communities enhance instructional quality and teacher effectiveness.

DISCUSSION

The findings of the study revealed that teachers implementing early numeracy instruction in public elementary schools of Maddela II District utilized contextualized, manipulative-based, and learner-centered pedagogical strategies to strengthen learners' mathematical understanding and engagement. Teachers recognized that young learners acquire mathematical concepts more effectively through concrete experiences, visual representations, and interactive classroom activities. The use of games, counting materials, storytelling, songs, and localized instructional resources allowed learners to actively participate in classroom instruction while developing foundational numeracy skills. These findings support Piaget's Cognitive Development Theory, which explains that children in the early years learn best through concrete operational experiences and active

exploration. Similarly, the findings align with Clements and Sarama (2020), who emphasized that experiential and manipulative-based instruction significantly improves learners' conceptual understanding and numeracy development.

The study also highlighted several instructional challenges affecting the teaching of early numeracy skills. Teachers experienced difficulties related to learners' varied abilities, weak foundational competencies, short attention spans, insufficient instructional materials, and limited parental support. The findings indicate that foundational learning gaps and inconsistent home support systems continue to affect learners' numeracy development, particularly among struggling learners. These findings support Vygotsky's Social Constructivist Theory, which emphasizes the importance of guided learning, social interaction, and supportive learning environments in cognitive development. Moreover, OECD (2019) emphasized that foundational learning difficulties are influenced by both classroom instruction and home-based learning conditions.

Despite these challenges, teachers demonstrated adaptability, resilience, and strong professional commitment in addressing learners' diverse needs. Participants utilized differentiated instruction, remediation activities, peer tutoring, and individualized support to improve learners' numeracy competencies. Teachers also engaged in collaborative learning, Learning Action Cell (LAC) sessions, and professional development activities to enhance their instructional competence and pedagogical effectiveness. These findings affirm Darling-Hammond et al. (2020), who emphasized that sustained professional development and collaborative professional culture significantly improve instructional quality and learner outcomes.

Overall, the findings demonstrate that effective early numeracy instruction requires not only pedagogical competence but also institutional support, parental involvement, and continuous teacher development initiatives. Teachers' instructional creativity and adaptability remain essential in strengthening foundational Mathematics education in Philippine elementary schools.

CONCLUSION

The study concluded that teachers in public elementary schools of Maddela II District, Schools Division of Quirino utilized contextualized, manipulative-based, and learner-centered pedagogical strategies in teaching early numeracy skills. Teachers employed games, visual aids, concrete learning materials, collaborative activities, and differentiated instruction to strengthen learners' foundational mathematical understanding and engagement. These instructional approaches contributed to more interactive and meaningful learning experiences among primary learners.

However, the study also concluded that teachers encountered several challenges related to learners' varied abilities, weak foundational competencies, insufficient instructional materials, limited parental involvement, and time constraints in addressing numeracy gaps. These instructional realities affected classroom management, lesson pacing, and remediation efforts among struggling learners.

Despite these challenges, teachers demonstrated adaptability, instructional creativity, and professional commitment through remediation activities, peer collaboration, and continuous pedagogical improvement. The study therefore concludes that effective early numeracy instruction requires strengthened institutional support systems, accessible contextualized learning materials, sustained teacher professional development programs, and stronger parental engagement initiatives to improve foundational Mathematics learning among elementary learners.

Implications of the Study

The findings of the study provide important implications for educational leaders, curriculum developers, policymakers, and teacher education institutions. Schools may strengthen foundational Mathematics programs through the provision of manipulative-based instructional materials, contextualized learning resources, and intervention programs for struggling learners. School administrators may also support teachers through enhanced Learning Action Cell (LAC) sessions, mentoring activities, and collaborative instructional planning initiatives.

The study further suggests the need for continuous professional development programs focusing on early

numeracy instruction, differentiated teaching strategies, classroom assessment, and learner-centered pedagogy. Educational institutions may also strengthen parental involvement programs that support learners' numeracy development at home.

Moreover, the findings contribute to the growing discourse on foundational Mathematics education and early childhood pedagogy in the Philippine context. The study may serve as a basis for future research focusing on learner achievement, numeracy intervention programs, teacher preparedness, and contextualized instructional practices in elementary Mathematics education.

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