Effectiveness of Multi-Faceted Tutorial Approach on Basic Literacy and Numeracy Among Struggling Learners and Insights from Pre-service Elementary Teacher-Tutors

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Abstract

The persistence of learning deficits in foundational literacy and numeracy among learners in public elementary schools underscores the urgent need to strengthen focused interventions. This study introduced a multi-faceted tutorial approach implemented by pre-service elementary teachers to provide targeted remediation for struggling learners while offering authentic, practice-based learning in initial teacher education. Designed as participatory educational research, the study employed a one-group pretest–posttest design replicated in six grade levels to determine the effectiveness of the intervention on learners' basic skills, and a descriptive qualitative approach to explore pre-service teacher-tutors' experiences and professional learning. Quantitative results showed significant improvements in reading fluency and basic numeracy, with vast majority of learners progressing from frustration to instructional or independent proficiency levels. Qualitative findings revealed that the pre-service teacher-tutors developed deeper pedagogical awareness, learning to differentiate instruction, scaffold tasks, and provide continuous feedback responsive to learners' needs. Their reflections indicated emerging professional identity characterized by empathy, patience, and learner-centered practice. Despite challenges such as variable learner engagement and limited home support, tutors demonstrated adaptive instructional decision-making. The findings highlight the dual value of school-based remediation programs: closing foundational learning gaps and strengthening teacher preparation through meaningful, situated teaching experiences. The study recommends sustained implementation of structured tutoring and expanded integration of field-based mentoring in initial teacher education programs.

Keywords: differentiated instruction, elementary education, initial teacher education, learning poverty, participatory educational research

1. Introduction

Foundational literacy and numeracy skills are the cornerstones of every child's educational journey as these are the building blocks not only for academic success and lifelong learning but also for empowering children to thrive as capable and productive members of the society (UNESCO, 2025). Literacy equips learners with the ability to read, write and comprehend meaning, while numeracy develops their capacity to reason, solve problems, and make informed decisions (OECD, 2023a). However, many elementary learners continue to struggle with mastering basic reading, writing, and arithmetic, which hinders their progress across all subject areas in most developing economies (Al-Samarrai, 2016). Albeit the inclusion of quality education among the sustainable development goals, there is persistence of global low literacy and numeracy levels as revealed in program studies and international large-scale assessments (ILSA) such as Trends in International Mathematics and Science Studies (TIMSS) and Programme for International Student Assessment (PISA) (Gamazo & Martinez-Abad, 2020; Fauzi et al., 2025; OECD, 2019, 2023b).

PISA 2022 reported unprecented overall decline in mean scores across OECD countries revealing 15 score points performance drop in mathematics and 10 points in reading (OECD, 2023a). The dramatic fall was largely attributed to Covid-19 pandemic though analysis before PISA 2018 already showed declining trend. It was further shown that socio-economically advantaged students scored about 50 to 90 points higher than disadvantaged students among 35 countries or economies implying that students in developing countries like the Philippines likely underperformed.

(OECD, 2023a, 2023b). School-specific contributing factors include teacher shortages, weak pre-service preparation, and limited access to sustained, subject-specific professional development (UNESCO & International Task Force on Teachers for Education 2030, 2024). Studies further link insufficient teacher knowledge and diagnostic skills to persistent learning poverty and slow recovery from pandemic-related disruptions (Abtahi & Planas, 2024; Graven & Jorgensen, 2024; Namkung et al., 2022).

Elementary teachers play a critical role in diagnosing learning difficulties, differentiating instruction, and creating supportive environments that build both competence and confidence among young learners (DepEd, 2017). Through explicit instruction, ongoing assessment, and contextualized teaching, teachers can help struggling learners strengthen foundational skills necessary for future academic success (Cheung et al., 2021; Ocampo, 2022). However, as global studies point out, disparities remain between the foundational literacy and numeracy skills learners need and the readiness of many teachers to deliver such instruction.

These gaps raise serious concerns about underachievement and educational inequality (UNICEF, 2022) implying reviews of educational policies, innovations in teaching-learning practices, curricular revisions in initial teacher preparation, and rigorous studies on the interplay of these factors along with socio-economic contexts and learner-related conditions. In response, this study addresses foundational literacy and numeracy deficits while simultaneously strengthening pre-service teacher preparation through experiential, school-based tutorial mentoring in relatively socio-economically disadvantaged school contexts in the Philippines.

1.1 Research Questions

The prevalence of frustration readers and non-numerates in public elementary schools highlights the necessity of strengthening literacy and numeracy programs to ensure that learners acquire essential skills by implementing comprehensive strategies and targeted interventions. The direct participation of prospective teachers bridges theory to practice towards an authentic and contextual learning in initial teacher education training. Hence, this study introduces the multi-faceted tutorials carried out by pre-service elementary teachers for a targeted foundational literacy and numeracy remediation among struggling learners. Specifically, it seeks to answer the following research questions.

1. What is the effectiveness of multi-faceted tutorials on literacy and numeracy achievement of struggling elementary learners?

2. What do pre-service elementary teacher-tutors experience in implementing multi-faceted tutorials?

3. How do pre-service elementary teacher-tutors interpret their tutorial experience in relation to their emerging professional identity and their understanding of student learning processes?

2. Literature Review

2.1 Foundational Literacy and Numeracy and Elementary Teachers Knowledge

Sustainable Development Goal (SDG) 4 aims to ensure inclusive and equitable quality education and promote lifelong learning for all (United Nations, 2015). Central to this goal is the development of foundational literacy and numeracy, which are essential for success in later learning and everyday decision-making. However, global assessments show persistent learning poverty, with many children unable to read with comprehension or perform basic numeracy tasks by the end of primary school (UNESCO, 2022; World Bank et al., 2022). Addressing this challenge requires strengthening early instruction through well-prepared teachers, evidence-based pedagogy, and targeted support for struggling learners.

Research shows that structured and intensive tutoring significantly improves literacy outcomes, particularly for learners at risk of reading difficulties (Wanzek et al., 2016). Multi-component approaches that integrate word study, fluency, vocabulary, and comprehension yield stronger gains than single-focus programs, with fluency-comprehension instruction further enhancing performance (Stevens et al., 2016; Cockerill et al., 2023). Science-of-reading frameworks emphasize systematic phonics, phonemic and morphological awareness, and language comprehension as interconnected factors for successful reading (Liu & Lahoz, 2024) while adaptive technology-based tutorials can provide individualized support (Filderman et al., 2022; Alqahtani, 2024). In numeracy, explicit instruction, scaffolding, and cumulative practice improve mathematical learning (Gersten et al., 2009). Targeted remediation is particularly effective in low-achieving contexts (Nickow et al., 2020), and early number sense development is essential for long-term reasoning (Jordan et al., 2022). Recent reviews confirm that structured, learner-focused tutoring can produce meaningful numeracy gains (Nelson et al., 2024; Svane et al., 2023).

Within these approaches, multisensory instructional designs engaging visual, auditory, tactile, and kinesthetic pathways were found to strengthen cognitive processing. For instance, Kelly and Philips (2022) detailed multisensory tasks with the Conquer Literacy program in teaching literacy to learners with dyslexia. These interventions demonstrate gains in vocabulary, comprehension, and motivation as children process information through multiple sensory channels (Solichah, & Fardana, 2024) such as the case of multisensory alphabet instruction significantly enhancing symbol recognition and early reading development among monolingual and bilingual learners (Park et al., 2025). Similarly, hands-on and sensory-rich activities in numeracy promote stronger conceptual understanding and problem-solving, as evidenced by improvements in mathematical performance when multisensory or manipulative-based approaches are used (Carbonneau et al., 2013; Pires, et al. 2019).

Despite these promising results, studies highlight persistent gaps in the preparedness of pre-service elementary teachers who are often tasked with delivering such interventions. Many aspiring teachers exhibit limited mastery of foundational literacy concepts and express uncertainty in supporting struggling readers (Daniel et al., 2025). In mathematics, pre-service teachers frequently encounter challenges in applying number sense and problem-solving principles to instructional design (López-Serentill, 2024). These patterns underscore the need to strengthen pedagogical content knowledge and ensure more structured, practice-based training experiences in initial teacher education programs (Sari, 2023).

2.2 Philippine Context: Basic Education and Initial Elementary Teacher Education

Ensuring that children acquire foundational literacy and numeracy skills in the early years of schooling remains a pressing challenge in the Philippines (UNICEF, 2022). Although the K–12 curriculum sought to improve educational quality through kindergarten integration, mother tongue–based instruction, and revised learning competencies (DepEd, 2016), assessments continue to reveal low proficiency among elementary learners (Haw et al., 2021; Igarashi & Suryadarma, 2023) placing the country among the lowest-performing education systems globally. The Early Grade Reading Assessment (EGRA) and the Philippine Informal Reading Inventory (Phil-IRI) show that many pupils struggle with decoding, fluency, and comprehension (DepEd, 2023a). In 2021, more than 90% of Filipino children aged ten were unable to read and understand simple texts, placing the Philippines among the countries with the highest learning poverty rates in East Asia and the Pacific (World Bank et al., 2022). Similar gaps are seen in numeracy. Results from Southeast Asia Primary Learning Metrics (SEA-PLM) and TIMSS show very low mathematics and numeracy proficiency among Filipino learners (UNICEF & SEAMEO, 2020) indicating widespread difficulty with number sense, arithmetic operations, and basic problem-solving.

In response, Republic Act No. 11899 (2022) established the Second Congressional Commission on Education (EDCOM 2) to conduct a national review of the education system. EDCOM 2 (2025) reported a severe foundational learning crisis beginning as early as early childhood. Only a quarter of Filipino children meet recommended nutrition levels in their first 1,000 days, contributing to stunting and poor school readiness. By Grade 3, many learners are already one to two years behind in literacy and numeracy. EDCOM 2 (2024) further identified governance fragmentation and weak alignment between DepEd and the Commission on Higher Education (CHED) as major contributors to inconsistent curriculum implementation and teacher preparation challenges. The Bachelor of Elementary Education (BEED) program intended to prepare prospective elementary has limited classroom-based practice and produces consistently low licensure examination performance due to discrepancies and mismatches between the curriculum and licensure examination (Irene, 2023). EDCOM 2 (2025) stresses the need for urgent, system-wide reforms that strengthen early learning, expand targeted remediation, improve teacher professional preparation and support, and enhance coordination across education agencies to reverse learning poverty and better prepare Filipino learners for future demands.

2.3 Framework for Multi-faceted Tutorial Approach

Tutorials have long been part of formal education, beginning with mentorship-based learning in medieval universities and later becoming structured in schools (Rashdall, 2010; VanLehn, 2011). Bloom's (1984) "two-sigma" study showed that one-to-one tutoring can produce much higher achievement than typical classroom instruction, leading to its use in remedial, enrichment, and differentiated learning. With the development of computer-assisted and intelligent tutoring systems, the tutorial expanded beyond private instruction to a scalable, learner-centered model that integrates personalization, dialogue, and responsive feedback (Kraft et al., 2024; Nickow et al., 2023).

Recent scholarship emphasizes that tutorials are most effective when they combine multiple instructional components rather than relying on a single strategy. Such tutorials integrate explicit teaching, scaffolded practice, dialogic questioning, multisensory activities, and mastery-based progression, supporting cognitive and motivational processes (Bakker et al., 2015; Dominguez & Svihla, 2023). This holistic approach is especially relevant in

foundational literacy and numeracy remediation, where learners need both skill building and confidence support. Hence, multi-faceted tutorials are conceptualized in this study as individualized interventions tailored to learners' skill profiles. As illustrated in Figure 1, multi-faceted tutorial approach is characterized by five dimensions: targeted learning goals, individualized instruction, diverse instructional strategies, continuous assessment and feedback, and sustained learner engagement. Instruction is adapted in pacing, difficulty, and scaffolding based on diagnostic observations (Black & Wiliam, 2018; Tomlinson, 2017). Tutors use modeling, guided practice, and visual or manipulative aids to provide accessible entry points into key concepts (Darling-Hammond et al., 2020; Hattie, 2023). Clear learning goals and opportunities to monitor progress help sustain motivation (Locke & Latham, 2019; Zimmerman & Moylan, 2009). Continuous assessment and feedback reinforce growth and address misconceptions (Carney et al., 2022; Rodríguez Rincón & Magreñán Ruiz, 2024). These integrated elements strengthen learner engagement, promoting inclusion, mastery, and lasting foundational skill development (Kahu & Nelson, 2018).

3. Methods

3.1 Research Design

This study is grounded in participatory educational research, which aims to improve teaching practices to enhance student learning and to strengthen teachers' professional competence by linking theory to practice (Mertler, 2004; Vaughan, 2020). Pre-service elementary teachers served as tutors in delivering a multi-faceted tutorial intervention intended to address basic literacy and numeracy difficulties among struggling learners. A one-group pretest–posttest design (Fraenkel et al., 2012) replicated in six grade levels was used to answer Research Question 1, determining the intervention's effects on learners' foundational skills. A descriptive qualitative approach (Colorafi & Evans, 2016) addressed Research Questions 2 and 3 by examining the mentoring experiences and insights gained by pre-service teacher-tutors regarding instructional preparation, implementation, and learner progress. Implementing the intervention across six grade levels enabled meaningful replication, while exploring pre-service teachers' reflections provided deeper understanding of how they develop pedagogical awareness and insight into learner needs during authentic teaching practice.

3.2 Participants and Study Context

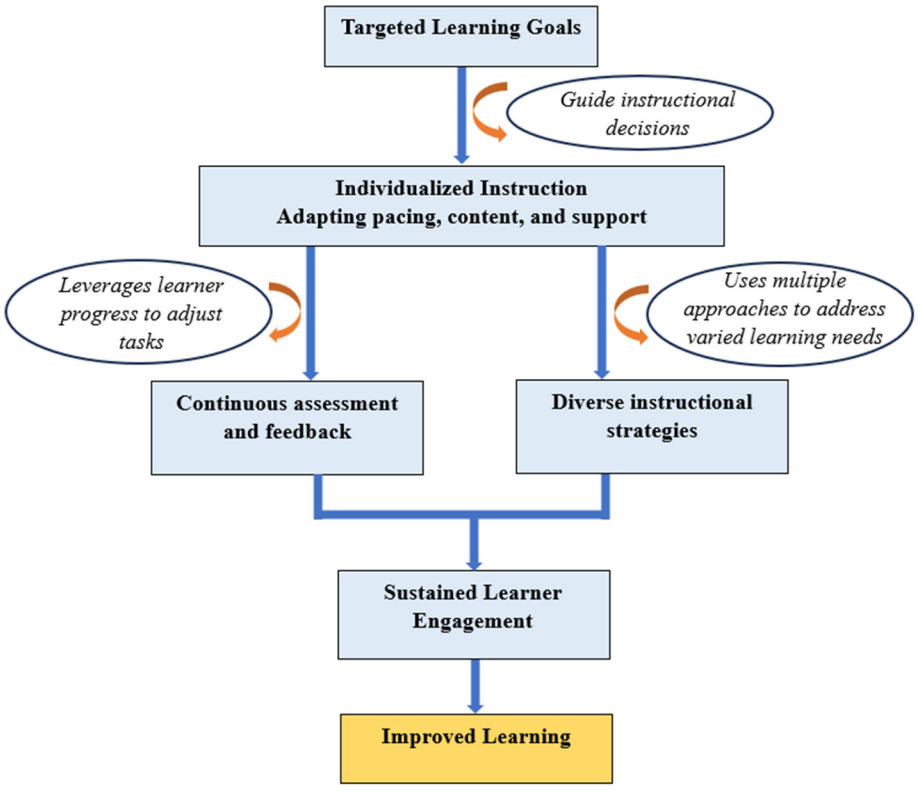

Figure 1. Author's Conceptualization of the Framework for Multi-Faceted Tutorial Approach

Two sets of participants were involved in the study as reflected in Table 1. The first set included 148 elementary learners from six grade levels in a public school in Capiz, Philippines. These learners were identified with basic literacy and numeracy difficulties based on the results of the Philippine Informal Reading Inventory (Phil-IRI) and the Enhanced Regional Unified Numeracy Test (ERUNT), both administered by the Department of Education. Learners classified under the frustration level in reading and those ranging from non-proficient to nearly proficient in numeracy were selected for the intervention.

The second set of participants consisted of 76 pre-service teacher-tutors enrolled in the Bachelor of Elementary Education (BEED) program in a nearby state university. Eligibility required completion of courses in the teaching of English and Mathematics in the elementary grades (CHED, 2017), ensuring foundational pedagogical preparation. To examine mentoring experiences, 18 teacher-tutors—three from each grade level—were purposively selected based on mentoring performance, portfolio quality, clarity of reflection, and willingness to participate. This study took place within a school–university partnership that integrates community-based immersion to contextualize pre-service teacher preparation while collaboratively addressing learners' foundational skill.

Table 1. Distribution of Participants by Grade Level

Grade Level	Learner participants		Pre-service elementary teacher-tutors	
	f	%	*f*	%
Grade 1	24	16.22	12	15.79
Grade 2	23	15.54	12	15.79
Grade 3	41	27.70	21	27.63
Grade 4	22	14.86	11	14.47
Grade 5	23	15.54	12	15.79
Grade 6	15	10.14	8	10.53
Total	148	100.00	76	100

3.3 Intervention, Research Materials and Data Gathering Procedures

3.3.1 Research Materials and Pre-intervention Procedures

Two sets of instruments were developed prior to intervention: reading competency test and numerical competency test for each grade level. The reading competency test is a 20-item test based on the Phil-IRI assessment tool consisting of oral reading and reading comprehension (DepEd, 2018). The numerical competency test is a 12-item assessment adapted from ERUNT that measures learners' skills in the four fundamental operations, number sense, and basic problem solving, aligned with the grade-level learning outcomes (DepEd, 2023b). These tests were validated by three educators in the university, two master teachers and one education supervisor in the DepEd. The tests were revised after validation and pilot-tested to elementary pupils in another school not participating in the study. Correlation coefficients obtained from test-retest method of reliability testing from Grade 1 to Grade 6 were .78, .83, .72, .77, .71, and .80, respectively, in literacy and .75, .84, .74, .75, .73, and .82, respectively, in numeracy tests. According to Terwee et al. (2007), reliability coefficient from correlations ≥.70 represents acceptable reliability of research instruments.

In the qualitative phase on teacher-tutors' reflections on their mentoring experience, interview guide questions were formulated by the researcher and presented to three educators specializing on qualitative research in education within the university for validation. Sample questions to address Research Question 2 are as follows.

- Main question: Can you tell me your experience in literacy/numeracy tutorial program?
  - Follow-up questions: What is your role in this program?
    What are the tasks assigned to you?
    How did you prepare for it?
- Main question: How did you carry out the assigned tutorial sessions?
  - Follow-up questions: What strategies did you use?
    How did you ensure that the learners learn in the process?

The pre-service teacher-tutors underwent mentoring and training from the researcher on implementing the

multi-faceted tutorial intervention and developing supporting instructional materials. Table 2 presents sample strategies and materials used. Coordination meetings with school officials set schedules, resource allocation, and shared responsibilities. As the study formed part of a school-requested project, separate ethics clearance was not required, though informed consent was obtained from the school head, teachers, parents, and tutors. Researcher-developed pre-tests were administered to establish learners' baseline literacy and numeracy levels before the intervention.

3.3.2 Intervention Procedures

The multi-faceted tutorial was implemented over three months, with one-hour daily sessions alternating literacy and numeracy practice. Through an adopt-a-child scheme, each teacher-tutor worked with no more than two struggling learners. The adopt-a-child approach in this study drew inspiration from similar fostering schemes undertaken by individuals or institutions in sponsoring the basic and educational needs of needy learners in public schools. While this practice is largely considered act of charity, there is a legally constituted Adopt-A-School program through Republic Act 8595 (DepEd, 2003) allowing private entities to provide assistance to schools in particular aspect of educational program and operation. In this study, the teacher-tutor "adopts" a struggling learner by acting as mentor-friend in providing individualized interventions, scaffolding social and cognitive development, and documenting learner's progress. Intervention content and approaches were differentiated based on learners' reading status, learning needs, maturity, and grade-level standards. Strategies included informal diagnostic tasks, scaffolded guided practice, multi-sensory and game-based activities, and selected digital tools. Teacher-tutors documented learner progress and their own reflections in anecdotal record books. The researcher conducted weekly meetings to monitor implementation, address challenges, and support instructional decision-making throughout the intervention.

Table 2. Multi-faceted Tutorial Strategies, Descriptions, and Teaching Materials

Tutorial strategy	Description	Teaching materials **used**
Informal interactive and diagnostic approaches	Establishes rapport with the learner and builds engagement while identifying specific learning difficulties and needs through interactive tasks and informal assessments.	Flashcards (letters, numbers, operations); picture charts and word walls; worksheets for word and number recognition, spelling, comprehension, and basic math operations.
Progressive guided practice with scaffolding	Begins with fundamental concepts and gradually progresses to more complex skills, supported by manipulatives, realia, ongoing assessment, and guided assistance.	Letter and number flashcards; counting manipulatives; real objects for counting and word recognition; structured activity sheets with increasing difficulty; educational games and puzzles.
Digital and ICT-based interactive learning	Uses computer-assisted tools to provide individualized, engaging, and interactive practice tailored to learner pace and needs.	Online learning videos and platforms, interactive applications, and digital worksheets.

3.3.3 Post-intervention Procedures

To gather evidence on the effectiveness of intervention and the insights gained by the teacher-tutors, post-test was administered to learner participants and in-depth interviews were conducted among the pre-service elementary teacher-tutors. In Grade 3, three learner participants were not able to take the post-test in literacy test due to health reasons.

3.4 Data Analysis Procedures

Descriptive statistics, including frequency counts, percentages, means, and standard deviations, were used to summarize learners' literacy and numeracy proficiency before and after the intervention. Reading proficiency was interpreted by converting the individual or group score into percentage score. The scale (DepEd, 2018): Frustration level (58 and below), Instructional level (59-79), Independent level (80-100) was the reference to assign reading levels to individual learners or entire group. Similarly for numeracy, individual or group performance was interpreted according to the ERUNT scale (DepEd, 2023b): Non-proficient (0-24), Less proficient (25-49), Nearly proficient (50 - 74), Proficient (75-89), Highly proficient (90-100).

To determine the significance of differences in learner performance, Wilcoxon signed rank tests were performed to compare pre-test and post-test scores. Effect sizes (r) were calculated and interpreted using Cohen's criteria: small ($\approx$.10), medium ($\approx$.30), and large ($\approx$.50) (Pallant, 2020). Statistical significance was set at the .05 level. Qualitative data from interviews were analyzed using Braun and Clarke's (2013) six-phase thematic analysis. The researcher familiarized herself with the data, generated initial codes, reviewed and refined codes, and grouped them into themes and subthemes that reflected recurring patterns. Themes were interpreted in relation to the study's research questions. To ensure trustworthiness, teacher-tutor intervention portfolios were examined for strategy verification, and member checking was conducted by returning synthesized findings to participants for confirmation and validation.

4. Results

4.1 Effectiveness of Multi-faceted Tutorials on Basic Literacy and Numeracy Achievement

The effectiveness of the multi-faceted tutorials was determined by examining the extent of improvement in the reading and numerical proficiency levels of struggling learners following the intervention. Descriptive statistics were employed to summarize learners' performance before and after the program, while inferential statistics were used to assess whether the observed changes were statistically significant. Together, these analyses provide evidence of the intervention's impact on learners' literacy and numeracy outcomes.

4.1.1 Reading Proficiency of Learner Participants

Results in Table 3 show that before the intervention, learners across all grade levels were at the frustration level in reading, demonstrating difficulty with decoding and comprehending grade-level texts. This reflects limited foundational literacy skills at baseline. After the multi-faceted tutorial intervention, substantial improvement was observed. All grade levels progressed to the independent level, demonstrating accurate and meaningful reading without assistance. The increase in mean scores and reduced variation in post-intervention performance suggest not only improved proficiency but greater consistency among learners. Hence, the intervention effectively supported struggling learners in becoming more confident and proficient readers.

Table 3. Pre- and Post-Intervention Reading Proficiency of Learner Participants

Grade Level	*N*	Pre-intervention reading ability			Post-intervention reading ability		
		M	*SD*	MPS	*M*	*SD*	MPS
Grade 1	24	3.46	1.96	17.30	16.63	1.88	83.15
Grade 2	23	3.61	2.17	18.05	17.13	2.10	85.65
Grade 3	38	2.97	1.42	14.85	17.03	2.38	85.15
Grade 4	22	4.82	3.40	24.10	17.36	2.15	86.80
Grade 5	23	4.09	2.79	20.45	17.39	1.90	86.95
Grade 6	15	6.13	3.11	30.65	18.6	1.12	93.00

Note: Mean percentage score (MPS) interpretation is based on the scale (DepEd, 2018): Frustration level (58 and below), Instructional level (59-79), Independent level (80-100).

The post-intervention distribution of reading proficiency levels shows a substantial improvement in learners' performance across grade levels. As shown in Table 4, no learners in Grades 1, 2, 4, 5, and 6 remained at the frustration level, indicating that the intervention successfully addressed severe reading difficulties for the majority of participants. Only a small proportion of Grade 3 learners (2.63%) continued to experience frustration, suggesting the need for further targeted support for some students at that level. Many learners progressed to the instructional level, particularly in Grades 1, 2, 3, 4, and 5, indicating they can now read with teacher scaffolding and are positioned for continued skill development. The most notable outcome is the substantial number of learners reaching the independent level—66.67% to 78.26% in Grades 1 to 5 and 100% in Grade 6—meaning they can now read grade-level texts accurately and with comprehension without assistance. Notably, the intervention significantly improved reading proficiency and promoted autonomous reading.

Table 4. Distribution of Learners by Post-Intervention Reading Proficiency Levels

Grade level	*N*	Post-intervention reading proficiency level distribution of learner participants					
		Frustration	%	Instructional	%	Independent	%
Grade 1	24	0	0	8	33.33	16	66.67
Grade 2	23	0	0	7	30.43	16	69.57
Grade 3	38	1	2.63	10	26.32	27	71.05
Grade 4	22	0	0	6	27.27	16	72.73
Grade 5	23	0	0	5	21.74	18	78.26
Grade 6	15	0	0	0	0	15	100

4.1.2 Numerical Proficiency of Learner Participants

The results presented in Table 5 show clear improvements in numerical ability across all grade levels following the intervention. Before the intervention, mean percentage scores ranged from 54.75% (nearly proficient) to 71.00% (nearly proficient), indicating only partial mastery of basic numeracy skills, especially in Grades 4 and 5 where scores fell below 60%. After the tutorial intervention, all grade levels demonstrated substantial gains. Post-intervention scores rose to above 84% (proficient to highly proficient) in Grades 1–4 and Grade 6, with Grades 1 and 3 showing the strongest outcomes with 92.36% (highly proficient) and 91.25% (highly proficient), respectively), reflecting high competency in foundational numeracy. Grade 6 also achieved a significant increase to 90.58%. Although Grade 5 improved to 68.08%, its score remained lower than the other grade levels, suggesting that older learners may require extended or more intensive support. The reduction in standard deviations further indicates greater coherence in learner performance. Overall, the multi-faceted numeracy tutorial intervention effectively strengthened numeracy skills and reduced performance variability.

Table 5. Pre- and Post-Intervention Numerical Proficiency of Learner Participants

Grade Level	*N*	No. of items	Pre-intervention numerical ability			Post-intervention numerical ability		
			M	*SD*	MPS	*M*	*SD*	MPS
Grade 1	24	12	7.92	2.96	65.97	11.08	1.50	92.36
Grade 2	23	12	8.52	2.39	71.00	10.57	1.38	88.08
Grade 3	41	12	8.10	1.89	67.50	10.95	1.22	91.25
Grade 4	22	12	6.73	1.12	56.08	10.14	1.13	84.50
Grade 5	23	12	6.57	1.70	54.75	8.17	1.11	68.08
Grade 6	15	12	7.53	1.30	62.75	10.87	0.743	90.58

Note: Interpretation of mean percentage score (MPS) is based on the scale (DepEd, 2023b): Non-proficient (0-24), Less proficient (25-49), Nearly proficient (50 - 74), Proficient level (75-89), Highly proficient (90-100).

The distribution of post-intervention numerical proficiency levels reflected in Table 6 shows substantial improvement across the grade levels. In Grade 1, the vast majority of learners (83.33%) reached the Highly proficient level, indicating strong mastery of foundational number skills. Grades 2 and 3 also demonstrate high levels of proficiency, with more than half of the learners in Grade 2 (56.52%) and over two-thirds in Grade 3 (68.29%) achieving the Advanced level. In Grades 4 and 6, proficiency is similarly strong, with 40.91% and 66.67% of learners, respectively, reaching Highly proficient level. The only exception is Grade 5, where most learners (65.22%) fall within the Nearly proficient level, suggesting partial mastery but a need for continued numeracy support. The presence of Nearly proficient learners is minimal across Grades 1-4, indicating that the intervention effectively reduced the number of learners with low numeracy skills for primary learners. The results reflect substantial gains in numerical proficiency, particularly in lower and upper grade levels, and highlight a need for sustained support in middle grades, particularly Grade 5.

Table 6. Distribution of Learners by Post-Intervention Numerical Proficiency Levels

Grade level	*N*	Post-intervention numerical proficiency level distribution of learner participants									
		Non-proficient	%	Less proficient	%	Nearly proficient	%	Proficient	%	Highly proficient	%
Grade 1	24	0	0	0	0	2	8.33	2	8.33	20	83.33
Grade 2	23	0	0	0	0	2	8.70	8	34.78	13	56.52
Grade 3	41	0	0	0	0	2	4.88	11	26.83	28	68.29
Grade 4	22	0	0	0	0	2	9.09	11	50.00	9	40.91
Grade 5	23	0	0	0	0	15	65.22	5	21.74	1	4.35
Grade 6	15	0	0	0	0	0	0	5	33.33	10	66.67

4.1.3 Effects of Multi-faceted Tutorials on Reading and Numerical Proficiency

The results presented in Table 7 indicate statistically significant improvements in both reading and numerical proficiency across all grade levels following the intervention. For reading, all grade groups demonstrated significant gains, with Z-values ranging from 3.43 to 5.39 and p-values < .001, indicating that the observed improvements are highly unlikely due to chance. The corresponding effect sizes (0.84–0.89) fall within the large range, suggesting that the intervention had a substantial impact on reading proficiency for all learners by Cohen's criteria (Pallant, 2011).

Similarly, numerical proficiency also showed significant improvement across grade levels, with Z-values ranging from −2.94 to −5.33 and p-values ≤ .003. The effect sizes (0.61–0.87) also fall within the large range, reflecting strong instructional effects. Grade 3 and Grade 6 demonstrated the largest numerical gains (r = .833 and r = .857, respectively), while Grade 5 showed the weakest, though still meaningful, improvement (r = .612). These results show the intervention produced positive learning outcomes in both literacy and numeracy across grade levels.

Table 7. Within-Group Comparisons in Reading and Numerical Proficiency of Learners

	Reading proficiency				Numerical proficiency			
Grade level	*N*	*Z*	*p*	Effect size	*N*	*Z*	*p*	Effect size
Grade 1	24	-4.301	< .001	0.878	24	-3.45	.001	.704
Grade 2	23	-4.206	< .001	0.877	23	-2.994	.003	.624
Grade 3	38	-5.387	< .001	0.841	41	-5.331	< .001	.833
Grade 4	22	-4.110	< .001	0.876	22	-4.080	< .001	.870
Grade 5	23	-4.203	< .001	0.876	23	-2.935	.003	.612
Grade 6	15	-3.433	< .001	0.886	15	-3.319	.001	.857

4.2 Pre-service Elementary Teacher-Tutors' Mentoring Experiences with Multi-faceted Tutorials

Thematic analysis of the teacher-tutors' narratives regarding their mentoring experiences with struggling learners revealed five interconnected themes. These include developing a clear understanding of their role as remediation tutors, actively carrying out specific mentoring tasks to support learners' literacy and numeracy needs, and encountering various instructional and contextual challenges during implementation. The tutors also engaged in reflective analysis of these challenges and identified or devised practical strategies and adaptive approaches to effectively address and overcome the difficulties encountered. In the following tables, the identity of teacher-tutors is denoted as PETT (pre-service elementary teacher-tutor).

4.2.1 Understanding the Role

The pre-service elementary teacher-tutors emphasized that their role extended beyond teaching basic literacy and numeracy skills. Presented in Table 8 are subthemes representing their specific roles as teacher-tutors. While they consistently supported struggling learners in developing reading, writing, spelling, counting, and simple problem-solving abilities, they also recognized the importance of motivating learners, building confidence, and providing emotional support. Their experiences reflect an emerging professional identity that integrates instruction

with care, patience, and responsiveness to individual needs. PETT 4 for instance was a visually impaired teacher-tutor eager to mentor another learner with special learning needs. Her approach toward the task was empathy and at the same time a personal commitment to mitigate her own limitations. Many described adapting strategies and pacing based on learner progress, viewing themselves not only as skill facilitators but as supportive guides who help learners persist and gain confidence.

Table 8. Teacher-Tutors Understanding of Their Mentoring Roles

Theme	Subthemes	Snippets from interviews
Understanding the role	Tutor as facilitator of foundational literacy and numeracy skills	*"My task is to teach the non-reader and non-numerate learners. My tasks are to teach and help them how to read, write, count"* (PETT 6).
		"I focused on simple reading, spelling, counting, and solving simple tasks, as these were the needed of my students." PETT 10
	Tutor as motivator and encourager	*"As a tutor, my main goal is to help my adopted child learn to read and compute and to overcome his learning difficulties in reading and numeracy by providing tutorial lessons and continuous encouragement."* (PETT 3).
		"As a tutor my task or responsibility is to teach them how to read, pronounce word and count the number correctly… to help them boost their confidence and enhance their determination towards learning literacy and numeracy" (PETT 8).
	Tutor as adaptive and reflective practitioner	*"At first, I didn't know how to perform my tasks because of my visual impairment"* (PETT 4).
		"*At first, everything felt exciting and new, but as time went by, it became quite challenging to balance my academic requirements and the extension work. Despite the stress and tiredness, the joy of seeing children learn and improve made all the effort worthwhile"* (PETT 15).

4.2.2 Carrying-out the Task

Table 9. Multi-Faceted Tutorial Strategies Implemented by Teacher-Tutors

Theme	Subthemes	Snippets from interviews
Carrying out the task	Building comfort and motivation	*"I always started my sessions by talking or playing with my adopted non-reader/non-numerate child to make him feel comfortable and interested"* (PETT 1).
		"I tried to make every session fun and engaging. I motivated them by offering small rewards like candies or positive feedback whenever they improved their reading or numeracy skills" (PETT 10).
	Differentiated and learner-responsive instruction	*"I have used differentiated strategies and approaches in conducting my remediation. I used game-based approach, inquiry-based approach and constructivism approach. These approaches helped me a lot since I am teaching diverse learners"* (PETT 5).
	Multisensory and hands-on learning	*"The main strategy I employed was multisensory differentiation. In reading, I combined visual aids with kinesthetic activities like letter tracing. In numeracy, I make use of manipulatives"* (PETT 2).
	Contextualization and real-life application	*"I also used contextualization, where I incorporate things they see and experiences they have known or experienced, so that they are more interested to learn"* (PETT 7).
	Strategic use of technology	*"I integrate technology as I let them watch a video on my phone especially how to pronounce the sound of letters in the alphabet correctly and … I print materials for them to read, write and solve. I too make use of digital worksheets on mathematics"* (PETT 8).

Detailed in Table 9 are multi-faceted tutorial strategies undertaken by teacher-tutors. Pre-service tutors began each session by establishing rapport with their adopted "children," using conversation, encouragement, and playful interaction to create a comfortable and trusting learning environment. Once rapport was established, they implemented a range of learner-responsive strategies, including differentiated instruction, multisensory and hands-on activities, contextualized tasks, and selective use of digital tools. Positive reinforcement such as praise, small rewards, and patient guidance helped reduce anxiety and sustain engagement. Tutors consistently emphasized adapting strategies to individual learner needs, noting that no single method worked for all. They adjusted pacing, materials, and scaffolds based on learners' progress and learning styles. A dominant pattern involved multisensory instruction—using visual aids, letter tracing, manipulatives, sticks, crayons, and real objects to support phonics and numeracy development—helping learners stay focused and better understand abstract concepts. Tutors also connected lessons to everyday experiences, especially in numeracy, using familiar contexts such as candies or household items to make tasks more meaningful. Some also integrated digital worksheets, pronunciation guides, and simple instructional videos to reinforce concepts and sustain attention. Together, these approaches supported both skill acquisition and confidence-building among non-readers and non-numerate learners.

4.2.3 Facing Challenges

Presented as subthemes in Table 10 are the notable challenges encountered by teacher-tutors arising from learner-related, contextual, and tutor-related factors. Learners' short attention spans and distractibility made sustaining focus difficult, slowing instructional pacing and requiring frequent reinforcement. Irregular attendance disrupted learning continuity, while weak retention in basic literacy and numeracy often necessitated reteaching. Contextual barriers, such as noisy and resource-deficit learning spaces, and limited parental support, further reduced learning reinforcement at home. Some teacher-tutors initially struggled with confidence and strategy selection but improved through practice and reflection. These challenges underscore the need for structured mentoring and scaffolded strategy training in pre-service teacher preparation.

Table 10. Challenges Encountered by Pre-Service Elementary Teacher-Tutors

Theme	Subthemes	Snippets from interviews
Encountering challenges	Learners' short attention span and inattentive behavior	*"Yes, … during the first 2 weeks because I find hard to make him focus and be engaged. The learner is not used that he is given such attention everyday"* (PETT 3).
		"Yes, I encountered challenges especially in dealing with the pupils' behaviors. Sometimes, they were not listening or they were easily distracted" (PETT 10).
	Irregular attendance and inconsistent learning engagement	*"The main challenges I encountered were the learners' short attention spans, inconsistent attendance, and lack of parental support"* (PETT 4).
	Difficulty retaining and applying learned skills	"*One of the difficulties I've experienced is the children's short memory retention and limited attention spans. For example, children often have a short memory retention span today I teach them CVC words, but the next day, they've already forgotten it"* (PETT 12).
	Environmental and contextual constraints	*"We tutored pupils in the hall, it was open but too hot and a bit dimmed. Since we were all there, it was noisy, and the distraction made it hard for the pupils to focus"* (PETT 10).
	Pre-service teachers' instructional readiness and confidence	*"It was my first time doing the tutorial sessions, I didn't really know how to teach and make students learn meaningfully. But as time went by, I have learned a lot of effective techniques to make the students learn"* (PETT 7).

4.2.4 Analyzing Challenges

Shown in Table 11 are subthemes emerging from teacher-tutors' analysis of challenges encountered. The pre-service elementary teacher-tutors identified learning difficulties as stemming from interconnected home, school, environmental, learner-specific, and tutor-related factors. Limited parental follow-up and inconsistent home support reduced retention and hindered the establishment of learning routines. The fact that many learners were

unaccustomed to sustained practice outside tutorials, slowing progress in literacy and numeracy reflects instructional incongruence in mainstream classes. Broader conditions such as unstable home environments and competing responsibilities further affected engagement. The teacher-tutors also noted varied cognitive readiness and learning styles, requiring differentiated instruction. Some early challenges reflected their own developing pedagogical confidence. By and large, literacy and numeracy growth required shared effort across learners, teachers, families, and tutors.

Table 11. Pre-service Elementary Teacher-Tutors' Analysis of Challenges Encountered

Theme	Subthemes	Snippets from interviews
Analyzing challenges	Limited parental support and home-based learning reinforcement	*"I believe these difficulties were rooted in factors such as lack of parental guidance, student motivation, or possible personal challenges at home"* (PETT 9).
	Environmental and socio-contextual factors affect learning	*"In terms of the students, I think the difficulties of students to learn basic knowledge and skills are rooted in their environment and their parents, … parents must support the study of their children by also teaching them at home, because I believe that it takes a village to make a student learn"* (PETT 7).
		"I think these difficulties came from differences in learners' backgrounds and learning space." (PETT 15)
	Learner diversity in cognitive readiness and learning styles	*"I think these difficulties are rooted from their levels of understanding and their learning style*
		because they have diverse learning styles" (PETT 6).

4.2.5 Overcoming Challenges

Detailed in Table 12 are the strategies employed by teacher-tutors in overcoming the mentoring-related challenges they encountered. The pre-service elementary teacher-tutors addressed learning challenges by using engaging, learner-centered strategies and developing reflective teaching practices. To sustain attention, they incorporated visual aids, manipulatives, digital worksheets, and small rewards. They adapted instruction to learners' readiness, using step-by-step modeling, real-life examples, repetition, and catch-up activities to strengthen comprehension and retention. Many emphasized patience, empathy, and emotional encouragement, recognizing that supportive interactions improved participation and learning. Some also sought mentoring and researched strategies independently, demonstrating emerging professional agency and growth in pedagogical competence.

Table 12. Strategies in Overcoming Challenges

Theme	Subthemes	Snippets from interviews
Overcoming challenges	Use of engaging and interactive instructional strategies	*"I adjusted by focusing more on spelling, writing, and math activities that she could understand better. I also provided some engaging visual instructions (like pictures and stickers), and digital worksheets in math and gave rewards so she will feel more motivated and recognized"* (PETT 1).
	Differentiated and scaffolding-based instruction	*"To overcome these. I gave him catch-up activities to help the learner review past lessons and not fall too far behind"* (PETT 9).
		"To cope with these difficulties, I make a consistent effort to recall and repeat the material we've discussed, helping them remember the key points of the lesson" (PETT 12).
	Building patience and positive disposition toward learners	"*Through these challenges, I learned to be more patient and to let them learn at their own pace"* (PETT 4)
		"I think and sometimes assume that the students who are naughty are the students who lack attention at home" (PETT 7).
	Seeking guidance and professional development	*"I researched and asked some of my cousins who are already teachers. Thus, I discovered various strategies and techniques to effectively teach the students"* (PETT 7)

4.3 Pre-service Elementary Teacher-Tutors' Interpretation of Mentoring Experiences with Multi-faceted Tutorials

As can be gleaned in Table 13, the tutorial experience significantly supported the prospective elementary teachers' professional growth, helping them develop patience, empathy, adaptability, instructional flexibility, and confidence. They learned that teaching is not only about delivering lessons but also about understanding diverse learner needs and providing emotional encouragement. Working with learners of varying abilities led them to adjust pacing, personalize strategies, and use varied techniques to better support progress. The experience also strengthened their emerging teacher identity by allowing them to apply theoretical knowledge in real contexts and refine communication and instructional skills. Many expressed increased motivation to become compassionate, supportive, and learner-centered future educators.

Table 13. Insights Gained by Pre-Service Elementary Teacher-Tutors from Mentoring Experience

Theme	Subthemes	Snippets from interviews
Insights from mentoring experience	Development of patience, empathy, and understanding	*"This experience taught me valuable lessons about patience, creativity, and adaptability in teaching. It helped me understand that every learner has unique needs and that teaching requires empathy and flexibility…As a future educator, I see myself as someone who creates a positive and encouraging environment where every learner feels valued and capable of success"* (PETT 1).
		"As a pre-service teacher, I learned that every learner has his own pace. Yes, they need to learn, but forcing them is not the answer" (PETT 4).
	Recognition of learner diversity and need for differentiated instruction	*"I learned how to adjust strategies depending on learners' abilities"* (PETT 1).
		"It made me realize that we can't teach everyone the same way" (PETT 12).
	Growth in teaching confidence and professional identity	*"This experience contributes greatly to my pre-service training by giving hands-on practice"* (PETT 11).
		"Now I can confidently help learners because I am more knowledgeable" (PETT 7).
		"It made me ready and equipped as a future teacher" (PETT 8).
	Strengthened commitment to the teaching profession	*This strengthened my desire to become a teacher who inspires and supports"* (PETT 1).
		"I now see myself as a more compassionate and dedicated future teacher" (PETT 15).
		"I want to be one of the reasons for my students' success" (PETT 7).

5. Discussion

5.1 Effectiveness of Multi-faceted Tutorials on Basic Literacy and Numeracy Achievement

The results show that the multi-faceted tutorial intervention effectively improved both reading and numeracy proficiency among struggling learners. The shift from frustration to instructional and independent reading levels indicates that systematic, scaffolded practice strengthened decoding, fluency, and comprehension. This supports evidence that integrated phonics, fluency, and comprehension instruction accelerates literacy development, particularly when paired with individualized support and timely feedback (Kim, 2020; Toste et al., 2020). Gains in reading autonomy highlight the importance of structured and targeted remedial sessions for early readers.

Similarly, notable improvements in numeracy proficiency reflect the benefits of repeated practice, explicit modeling, and cumulative review. These results align with research showing that scaffolded numeracy instruction builds conceptual understanding and procedural fluency (Siegler & Lortie-Forgues, 2022). The smaller gains among Grade 5 learners suggest the need for longer intervention duration and more emphasis on real-world problem-solving to address entrenched misconceptions. The significant effect sizes across outcomes further validate multi-component remediation models and support DepEd's call for sustained, differentiated, and intensive instructional support to reduce learning gaps and promote equitable learning progress.

5.2 Pre-service Elementary Teacher-Tutors' Mentoring Experience with Multi-faceted Tutorials

The findings show that the pre-service elementary teacher-tutors understood their primary role as supporting learners in developing foundational literacy and numeracy skills, particularly among non-readers and non-numerate students. This aligns with remediation models that emphasize targeted instructional support to address early learning gaps (Toste et al., 2020). However, the pre-service elementary teacher-tutors also recognized that effective tutoring extends beyond academic instruction. They consistently highlighted the need to motivate learners, build confidence, and provide emotional encouragement, demonstrating that engagement and persistence are closely tied to supportive teacher–learner relationships (Aldrup et al., 2024). These insights reinforce that remediation requires integrating socio-emotional support with explicit skill instruction.

The pre-service elementary teacher-tutors demonstrated intentional instructional preparation by reviewing lessons, sequencing tasks, and selecting varied materials such as flashcards, manipulatives, visual aids, and digital tools. Thoughtful planning and the use of diverse instructional resources are known to enhance remedial instruction (Toste et al., 2020). Their willingness to revise approaches and strengthen content understanding reflects developing reflective practice, which is an important element of early teacher identity formation (Cai et al., 2022). These insights suggest that teacher education programs should more deliberately support structured lesson planning, materials development, and guided reflection to cultivate adaptive instructional habits. Likewise, basic education institutions should also emphasize continuing professional development of in-service teachers on strengthening teachers' capability in adopting evidence-based and reflective teaching. and conducting participatory researches to contextually address literacy and numeracy issues in their classes.

The teacher-tutors applied learner-centered strategies that align with research on adaptive teaching. Their narratives identified that sustained individualized instruction tailored to the learner's needs and employing engaging and active learning strategies in a child-friendly environment produced the desired effect of remediation. This confirms prior assertions that rapport-building improves engagement (Mammadov & Schroeder, 2023), while differentiated pacing and scaffolding addresses diverse readiness levels (Langelaan et al., 2024). The multi-facted tutorial approach also share similarities with The Conquer Literacy program which presents a step-by-step approach in addressing reading among learners with dyslexia (Kelly & Phillips, 2022). Similarly, hands-on techniques such as letter tracing and object-based counting supported foundational literacy and numeracy (Lantz & Miller, 2019), and contextualized tasks linked learning to real-life applications to deepen comprehension (Vessonen et al., 2024). The tutors also used visual representations paired with guidance to support understanding (Schoenherr et al., 2024). Formative assessment through questioning, reading checks, and worksheet review guided instructional adjustments (Black & Wiliam, 2018), while timely feedback and retrieval practice supported retention (Hattie & Clarke, 2019; Pan & Rickard, 2018; Roediger & Karpicke, 2006).

Teacher-tutors reported that many of the challenges they encountered stemmed from learner-related factors, including weak cognitive abilities, short attention spans, inattentive behaviors, and limited retention, which were often linked to external influences such as environmental distractions and insufficient parental reinforcement. These conditions have been widely documented as detrimental to early learning outcomes (Gottfried & Gee, 2017; Kim, 2020; Silinskas et al., 2020; Toyinbo, 2023). To address these challenges, the pre-service elementary teacher-tutors used interactive materials, real-life examples, digital tools, step-by-step modeling, repeated practice, and positive reinforcement. Although teacher-tutors did not explicitly attribute learners' underachievement to instructional contexts, students' learning behaviors frequently reflect the quality and developmental appropriateness of pedagogical practices. Weak cognitive performance and poor retention may persist when instruction is misaligned with learners' cognitive needs, learning styles, and developmental readiness (Ambrose et al., 2010; Darling-Hammond et al., 2022; Liu & Lahoz, 2024). Reviews have also shown that teachers' insufficient ability in diagnosing learning difficulty is contributory to persistent learning poverty (Abtahi & Planas, 2024; Graven & Jorgensen, 2024; Namkung et al., 2022). These findings underscore the need for institutionally supported participatory studies to address literacy and numeracy challenges within specific classroom settings that benefit both teachers and learners.

At the personal level, several pre-service elementary teacher-tutors initially encountered internal struggles related to confidence, instructional decision-making, and the selection of appropriate pedagogical strategies. Such challenges reflect the developing professional identity particularly in supporting struggling readers and the iterative nature of pedagogical competencies (Cai et al., 2022; Daniel, 2025). These also underscore how novice teachers frequently negotiate tensions between theoretical preparation and the practical demands of actual teaching practice (Grossman et al., 2009). Consequently, these early difficulties also highlight the importance of a well-designed community

outreach program that supports pre-service teachers' professional growth without compromising their regular academic commitments.

Despite these challenges, the teacher-tutors reframed the experience as an opportunity to strengthen their mentoring competencies. Their coping strategies included cultivating patience and a positive disposition toward learners, sustaining focus on instructional goals, seeking professional guidance, and engaging in self-directed learning—behaviors aligned with reflective and adaptive teaching practices (Korthagen, 2017). For many, the experience served as a formative phase in their professional metamorphosis. They reported increased patience, adaptability, and refined instructional judgment, demonstrating how supervised, hands-on teaching experiences foster both pedagogical competence and emerging teacher identity. Moreover, participants developed greater awareness of learner diversity and the principles of developmentally appropriate pedagogy, alongside enhanced confidence and a strengthened commitment to the teaching profession.

5.3 Pre-service Elementary Teacher-Tutors' Interpretation of Mentoring Experience with Multi-faceted Tutorials

The findings indicate that the literacy and numeracy remediation program significantly shaped the pre-service teacher-tutors' emerging professional identities. Their reflections show a shift from viewing teaching as merely delivering lessons to understanding it as a relational, learner-centered practice. The development of patience, empathy, and flexibility highlights how they recognized that emotional support is as crucial as academic instruction for struggling learners, reinforcing that positive teacher–learner relationships enhance motivation and persistence (Zhang, 2022). The pre-service elementary teacher-tutors also recognized diverse learner abilities and adopted differentiated strategies, demonstrating an understanding that tailored instruction is essential for inclusive teaching (Pozas et al., 2021). Their growing confidence in adapting methods and using varied techniques reflects early professional identity formation strengthened through real classroom experience (Cai et al., 2022). These insights align with DepEd's National Learning Recovery Program, which emphasizes targeted remediation and individualized support to address foundational skill gaps.

5.4 Further Implications to Theory and Practice

The results reinforce that foundational literacy and numeracy are strengthened through scaffolded, multi-component instruction integrating decoding, fluency, comprehension, number sense, and procedural practice. The significant gains align with cognitive learning theories emphasizing guided practice and structured feedback in supporting working memory and independent performance (Kim, 2020; Siegler & Lortie-Forgues, 2022). The study also illustrates how pre-service teachers develop learner-centered and relational teaching identities when engaged in authentic classroom contexts, consistent with socio-cultural perspectives of learning shaped through interaction and responsiveness (Cai et al., 2022). Practically, the effectiveness of multi-faceted tutorials supports embedding structured remediation into regular school programs, especially in early grades. Differentiated and multisensory approaches were essential for addressing varied learner needs (Pozas et al., 2021), while supervised, hands-on fieldwork enhanced pre-service teacher confidence. Strengthening home–school collaboration remains crucial to sustaining learning gains.

As cases of struggling learners become a serious educational concern associated with actual teaching-learning practice, in-service teachers may integrate structured, scaffolded and multifaceted approaches in differentiated instruction to strengthen learners' foundational literacy and numeracy skills. This, however, calls for in-service teachers to engage in training on differentiated instruction, evidence-based literacy and numeracy interventions, multisensory strategies, and mentoring skills to enhance remediation programs and foster responsive, learner-centered teaching.

6. Conclusion

The multi-faceted literacy and numeracy tutorial intervention effectively improved foundational skills among struggling learners, as shown by significant gains in reading and numeracy across grade levels. Learners progressed from frustration to instructional and independent reading levels and demonstrated higher numeracy proficiency, underscoring the value of structured, scaffolded, and sustained remediation. These results affirm that targeted interventions using varied strategies and continuous feedback can close early learning gaps and support more equitable outcomes. The program also contributed meaningfully to the professional growth of pre-service teacher-tutors. Through direct work with learners, the pre-service elementary teachers developed patience, empathy, and adaptability, learning to differentiate instruction, adjust pacing, and tailor learning materials. Their reflections indicate emerging teacher identity grounded in relational, learner-centered practice. While challenges such as

inattentiveness and limited home support persisted, the teacher-tutors' adaptive strategies demonstrated growing instructional judgment and alignment with school-based learning recovery priorities.

7. Limitations and Future Research Directions

The study acknowledges several limitations that present opportunities for future research. Given the short-term implementation of the intervention, longitudinal studies are recommended to determine whether gains in literacy and numeracy are sustained over time. Since the intervention was conducted in only one school, comparative research across diverse school contexts may help identify factors that influence its effectiveness. Further investigation is also needed on extended or intensified tutorial approaches for older learners, particularly those in Grade 5 who may have experienced longer class disruption during pandemic as well as exploring the impact of multi-faceted tutorials on other cognitive abilities. Exploring blended or digital remediation may reveal whether technology can enhance learner engagement when integrated with tutoring. Additionally, studies could examine structured home-based reinforcement strategies and how the process of providing remedial instruction contributes to the professional identity development of pre-service teachers.

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