

National Mathematics Program and Its Relationship to Learners' Attitude, Engagement, and Perceived Mathematical Competence: Basis for Policy Recommendations

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Abstract

This study examined the relationship between the implementation of the National Mathematics Program (NMP) and learners' attitudes toward Mathematics, engagement, and perceived mathematical competence among Key Stage 2 learners in selected public elementary schools in the northern part of the Fifth Congressional District of Cebu Province. Anchored on Bandura's Social Cognitive Theory and Expectancy–Value Theory, the study aimed to provide evidence-based policy recommendations for improving mathematics education. A descriptive–correlational quantitative research design was employed involving 301 Grade 4 to Grade 6 learners selected through complete enumeration. Data were collected using an adapted structured questionnaire based on validated instruments and analyzed using frequency counts, percentages, weighted mean, standard deviation, Pearson Product–Moment Correlation Coefficient, independent-samples t-test, and one-way Analysis of Variance (ANOVA). The findings revealed that learners demonstrated a neutral evaluation of the NMP, a positive attitude toward Mathematics, and moderate levels of engagement and perceived mathematical competence. Significant relationships were found between the implementation of the NMP and learners' mathematical self-concept, perceived usefulness, engagement, and perceived mathematical competence, while no significant relationship was found with learners' interest in Mathematics. No significant difference in program evaluation was observed according to sex, whereas significant differences existed across grade levels. Learners also experienced instructional and cognitive challenges, particularly in understanding mathematical concepts and completing Mathematics activities. The study concludes that although the NMP contributes to improving learners' attitudes, engagement, and perceived mathematical competence, its implementation requires strengthened learner-centered instructional practices, differentiated interventions, continuous monitoring, and enhanced instructional support. The study aligns with SDG 4 (Quality Education) and SDG 8 (Decent Work and Economic Growth) by promoting improved mathematics learning and foundational competencies. Its findings contribute to educational, policy, and community sustainability by supporting evidence-based improvements in mathematics instruction and learner outcomes.

Keywords: Attitude Toward Mathematics, Engagement, National Mathematics Program, Perceived Mathematical Competence, Policy Recommendations, Public Elementary Schools, Quality Education, Social Cognitive Theory, Sustainability, Expectancy–Value Theory

1. Introduction

Mathematics plays a vital role in developing learners' logical reasoning, problem-solving, and decision-making skills. However, educational disruptions and persistent learning gaps have adversely affected mathematics achievement among Filipino learners, emphasizing the need for effective interventions that support both cognitive and affective learning outcomes. In the Philippine context, the implementation of the MATATAG Curriculum and the National Mathematics Program reflects continuing efforts to improve foundational numeracy and mathematics instruction in response to these challenges (Mamolo & Sugano, 2023). In response, the Department of Education implemented the National Mathematics Program (NMP) to strengthen foundational numeracy, improve instructional quality, and accelerate learning recovery. While the program primarily targets academic achievement, understanding its relationship with learners' attitudes, engagement, and perceived mathematical competence is equally important because these factors influence motivation, persistence, and overall learning success. This study therefore examines the relationship between the implementation of the NMP and learners' attitude, engagement, and perceived mathematical competence to provide evidence-based policy recommendations for improving mathematics education.

1.1 Background of the National Mathematics Program and Learners' Mathematical Learning

Educational disruptions created significant learning losses worldwide, particularly in Mathematics, making learning recovery a priority for education systems. Similar concerns were reported across Asia, where the COVID-19 pandemic

widened learning inequalities and emphasized the need for comprehensive learning recovery strategies (Asian Development Bank, 2021). Mathematics is fundamental in developing learners' logical thinking, problem-solving, and decision-making abilities while supporting lifelong learning. The United Nations' Sustainable Development Goal 4 (Quality Education) emphasizes ensuring that learners acquire foundational literacy and numeracy skills (United Nations, 2015). Nevertheless, international assessments consistently indicate that Filipino learners continue to perform below international standards in Mathematics, highlighting the need for interventions that strengthen not only achievement but also learners' confidence, interest, and engagement. To address these concerns, the Department of Education introduced the National Mathematics Program (NMP), which aligns with the Basic Education Development Plan 2030 and seeks to improve mathematics learning by enhancing student outcomes, supporting teachers, and addressing learning losses (DepEd, 2023). The program is implemented through DepEd Order No. 13, s. 2023, which provides standardized guidelines to ensure consistent and meaningful mathematics instruction across schools (DepEd Order No. 13, s. 2023). Beyond improving mathematics achievement, the NMP also has implications for learners' classroom experiences. Learners' attitudes toward Mathematics, engagement in learning, and perceived mathematical competence influence their willingness to participate, persist, and overcome learning challenges. Positive perceptions encourage active participation, whereas negative experiences may reduce motivation even when learners possess the necessary abilities. At the local level, many public elementary schools continue to report considerable numbers of learners performing at the Emerging proficiency level despite existing mathematics interventions. These persistent learning gaps affect learners' confidence, classroom participation, and engagement. Although current interventions primarily focus on remediation and academic improvement, limited attention has been given to examining how the implementation of the NMP relates to learners' attitudes, engagement, and perceived mathematical competence. Addressing this gap provides an opportunity to generate evidence-based recommendations that can strengthen program implementation and improve mathematics learning outcomes.

1.2 Themes and Insights on the National Mathematics Program, Learners' Attitude, Engagement, and Perceived Mathematical Competence

The reviewed literature emphasizes that effective mathematics programs extend beyond improving academic performance by fostering positive learner attitudes, active engagement, and confidence in mathematical ability. Contemporary educational reforms advocate systematic program evaluation as a means of improving instructional quality, ensuring implementation fidelity, promoting learner engagement, and supporting evidence-based educational improvement. Countries that regularly evaluate mathematics programs demonstrate stronger learner outcomes and reduced achievement gaps, while continuous monitoring enables timely identification of instructional strengths and learner difficulties (OECD, 2023; García and Weiss, 2021; UNESCO, 2021; Department of Education, 2022). Research further indicates that effective mathematics interventions integrate continuous assessment, scaffolded instruction, active learner participation, collaborative learning, conceptual understanding, and teacher professional development. Effective mathematics instruction emphasizes the development of deep conceptual knowledge rather than procedural fluency alone (Hiebert & Grouws, 2007; Rittle-Johnson et al., 2020). Meta-analytic evidence also shows that mathematics self-efficacy is a strong predictor of academic achievement (González et al., 2023), while motivation remains an important determinant of sustained mathematics learning (Middleton et al., 2021). These practices improve mathematical reasoning, conceptual understanding, learner engagement, and instructional effectiveness while supporting sustainable program implementation (Darling-Hammond et al., 2020; Kraft et al., 2021; Hill & Chin, 2022; Nguyen et al., 2023; Desimone & Garet, 2021; Department of Education, 2023). Studies also consistently identify learners' attitudes toward Mathematics as an important predictor of engagement, persistence, and achievement. Developing learners' mathematical mindsets is likewise essential because students who believe that mathematical ability can be developed through effort are more likely to persevere during challenging learning tasks (Boaler, 2016; Dweck, 2006). Positive attitudes, confidence, motivation, and reduced mathematics anxiety contribute to greater participation and improved learning outcomes, whereas negative perceptions often result in avoidance behaviors and lower achievement (Wang & Degol, 2020; Boaler, 2022; OECD, 2022; UNESCO, 2021; Darling-Hammond et al., 2020; Hill & Chin, 2022). Likewise, academic self-concept and self-efficacy, although closely related, are distinct constructs that independently influence learners' motivation and mathematics achievement (Bong & Skaalvik, 2021). Positive mathematical self-concept has likewise been shown to predict higher achievement across different educational settings (Areepattamannil et al., 2021).

1.3 Global, National, and Local Context of the National Mathematics Program and Mathematics Learning

Globally, mathematics learning recovery has become a major educational priority following widespread learning disruptions. International organizations emphasize that targeted interventions, diagnostic assessments, and evidence-based instructional reforms are necessary to address persistent learning gaps and strengthen foundational mathematical competencies (OECD, 2023; UNESCO, 2022). These initiatives recognize that improving mathematics education requires not only higher academic achievement but also increased learner motivation, engagement, and confidence. International large-scale assessments such as TIMSS continue to demonstrate persistent gaps in mathematics achievement among many education systems, emphasizing the need for sustained instructional reforms and learner support (Mullis et al., 2020). Likewise, evidence indicates that pandemic-related learning losses have significantly affected learners' mathematical achievement, requiring comprehensive recovery initiatives (Reardon, 2021; World Bank, 2022). At the national level, the

Department of Education has institutionalized learning recovery through the National Mathematics Program (NMP). DepEd Memorandum No. 110, s. 2022 intensified initiatives addressing learning loss by promoting diagnostic assessments, targeted remediation, and strengthened instructional delivery. These efforts were reinforced through DepEd Order No. 13, s. 2023, which established nationwide learning recovery interventions, prioritized Mathematics as a core learning area, encouraged the use of the Rapid Mathematics Assessment (RMA), and promoted continuous assessment and responsive instructional practices to help learners attain grade-level proficiency. These policy directives provide schools with institutional support for implementing data-driven and learner-centered mathematics instruction. Within the local context, public elementary schools in the Fifth Congressional District of Cebu Province continue to experience challenges in improving learners' mathematical proficiency despite implementing national interventions. School-based assessments consistently indicate that many learners remain at the Emerging proficiency level, suggesting persistent foundational learning gaps that affect learners' confidence, classroom participation, and engagement. The selected public elementary schools actively implement the NMP while serving learners from diverse socioeconomic backgrounds, making them appropriate settings for examining how program implementation relates to learners' attitudes, engagement, and perceived mathematical competence.

1.4 Theoretical and Conceptual Basis of the National Mathematics Program, Learners' Attitude, Engagement, and Perceived Mathematical Competence

This study is anchored on established learning and motivation theories explaining how instructional practices, learner beliefs, and educational environments influence mathematics learning. The National Mathematics Program emphasizes strengthened instruction, formative assessment, and learner-centered pedagogies consistent with contemporary educational reforms (Department of Education, 2023). The primary theoretical foundation is Albert Bandura's Social Cognitive Theory (Bandura, 1986), which explains that learning results from reciprocal interactions among personal factors, behavior, and environmental influences. Central to this theory is self-efficacy, which refers to learners' beliefs in their capability to perform academic tasks successfully (Bandura, 1997). Learners with stronger mathematical self-efficacy demonstrate greater persistence, engagement, and achievement (Schunk & DiBenedetto, 2021; Usher & Pajares, 2023). Within the NMP, structured learning activities, continuous assessment, and supportive instructional environments are expected to strengthen learners' confidence and participation in mathematical problem solving. The study also incorporates Expectancy-Value Theory, recognizing that learners' expectations of success and the value they assign to mathematics influence their motivation, engagement, and academic performance. Together with national education policies, these theories explain how instructional support, learner motivation, and policy-driven interventions collectively contribute to mathematics learning outcomes. Conceptually, the study treats the National Mathematics Program as the independent variable, while learners' attitude toward Mathematics, engagement in Mathematics, and perceived mathematical competence serve as the dependent variables. The framework assumes that strengthened instruction, formative assessments such as the Rapid Mathematics Assessment, and targeted interventions contribute to improved learner confidence, motivation, engagement, and mathematical performance, ultimately providing a basis for evidence-based policy recommendations. The theoretical framework further illustrates that Social Cognitive Theory, Expectancy-Value Theory, and relevant DepEd policy directives collectively support the implementation of the National Mathematics Program, which in turn informs the proposed policy recommendations.

1.5 Research Gaps on the National Mathematics Program and Learners' Mathematical Learning Outcomes

Despite the nationwide implementation of the National Mathematics Program (NMP), limited empirical research has examined how learners experience the program beyond its intended academic outcomes. Existing policy documents primarily describe the program's objectives, implementation procedures, and learning recovery strategies, while insufficient attention has been given to understanding how the NMP influences learners' attitudes toward Mathematics, engagement in learning, and perceived mathematical competence. Since these affective factors shape learners' motivation, persistence, and overall academic success, evaluating their relationship with the NMP is essential for determining the program's broader educational impact. At the local level, many public elementary schools continue to report substantial numbers of learners performing at the Emerging proficiency level despite the implementation of mathematics interventions. Although current initiatives largely emphasize remediation and academic skill development, evidence remains limited regarding how the implementation of the NMP relates to learners' classroom experiences, confidence, and engagement. Addressing this gap provides an opportunity to generate evidence that can strengthen program implementation, improve instructional practices, and support policy enhancement within the Department of Education. The reviewed literature likewise indicates that mathematics program evaluation has traditionally focused on instructional effectiveness, learner achievement, and implementation fidelity. While recent studies recognize the importance of affective variables such as attitudes, motivation, and engagement, there remains a need for contextualized investigations that simultaneously examine learners' evaluations of mathematics programs together with their attitudes, engagement, and perceived mathematical competence, particularly within Philippine public elementary schools. Such evidence is essential for developing comprehensive policy recommendations grounded in both cognitive and affective learning outcomes (OECD, 2022; OECD, 2023; UNESCO, 2021; UNESCO, 2022; Darling-Hammond et al., 2020; Wang & Degol, 2020; Boaler, 2022). Accordingly, this study examines the relationship between learners' evaluation of the National Mathematics Program and

their attitude toward Mathematics, engagement, and perceived mathematical competence among Key Stage 2 learners in selected public elementary schools. The findings are intended to provide empirical evidence that supports evidence-based policy recommendations, strengthens mathematics program implementation, and enhances mathematics learning outcomes in Philippine basic education.

1.6 Alignment of the National Mathematics Program with Relevant Sustainable Development Goals (SDGs)

This study directly aligns with SDG 4 – Quality Education, which promotes inclusive and equitable quality education and lifelong learning opportunities by strengthening foundational literacy and numeracy. The National Mathematics Program supports this goal by addressing learning gaps, improving mathematics instruction, enhancing learner engagement, and promoting meaningful learning experiences that contribute to improved educational quality (United Nations, 2015; DepEd, 2023; DepEd Order No. 13, s. 2023). The study also supports SDG 8 – Decent Work and Economic Growth, as strengthened mathematical competence, critical thinking, and problem-solving skills contribute to developing a workforce equipped with competencies required for future employment and national development. By improving learners' mathematical readiness through effective instructional interventions, the study contributes to building human capital essential for sustainable economic growth.

1.7 Importance of the National Mathematics Program to Multidisciplinary Sustainability

The study contributes primarily to educational sustainability by generating evidence that can improve mathematics instruction, learner engagement, and the implementation of the National Mathematics Program. The findings may guide teachers, school administrators, curriculum developers, and policymakers in designing interventions that promote continuous improvement in mathematics education and strengthen learning recovery initiatives. The study likewise contributes to policy and governance sustainability by providing empirical evidence that supports evidence-based educational decision-making and policy enhancement within the Department of Education. Its findings may assist education leaders in strengthening instructional support mechanisms, monitoring program effectiveness, and promoting learner-centered educational reforms aligned with national learning recovery initiatives. Furthermore, the study supports community and socio-economic sustainability by promoting improved mathematical competence, confidence, and engagement among elementary learners. Strengthening these competencies prepares learners for lifelong learning, informed decision-making, and meaningful participation in society while contributing to the long-term development of a knowledgeable and productive citizenry.

2. Material and methods

2.1 Research Design

This study employed a descriptive–correlational quantitative research design to examine learners' evaluation of the National Mathematics Program and its relationship with learners' attitudes toward Mathematics, engagement in learning, and perceived mathematical competence. It also identified the challenges encountered during program implementation. The descriptive component was used to describe learners' perceptions of the NMP, their attitudes toward Mathematics in terms of self-concept, perceived usefulness, and interest, their engagement, perceived mathematical competence, and the challenges they experienced. Demographic characteristics, specifically sex and grade level, were likewise described using descriptive statistics. The correlational component examined the relationships among naturally occurring variables based on learners' self-reported experiences without manipulating any conditions. This design is appropriate for describing existing educational conditions and determining relationships among variables in program evaluation studies that generate empirical evidence for educational improvement and decision-making (Creswell & Creswell, 2022; Johnson et al., 2020). The evaluation of educational programs is likewise consistent with the Context, Input, Process, and Product (CIPP) Evaluation Model, which emphasizes systematic assessment for continuous program improvement and accountability (Stufflebeam & Zhang, 2017).

2.2 Locale of the Study

The study was conducted in selected public elementary schools located in the northern part of the Fifth Congressional District of Cebu Province. These schools implement Department of Education initiatives, including the National Mathematics Program, and follow the K to 12 Basic Education Curriculum. They serve learners from diverse socioeconomic backgrounds and provide instruction to Grades 4 to 6, whose learners possess sufficient cognitive, reflective, and metacognitive abilities to express their perceptions and experiences regarding Mathematics and the implementation of the NMP. The participating schools were purposively selected because they actively implement the National Mathematics Program, regularly conduct mathematics interventions and assessments, and represent typical public elementary school settings within the district. Their accessibility, coordination with school administrators, and compliance with Department of Education administrative and ethical requirements facilitated efficient data collection. Although the schools differ in size, resources, and student population, they share the common objective of strengthening learners'

numeracy skills and improving mathematics learning outcomes through the implementation of the National Mathematics Program.

2.3 Respondents of the Study

The respondents were 301 Grade 4, Grade 5, and Grade 6 learners from selected public elementary schools in the northern part of the Fifth Congressional District of Cebu Province. These learners were selected because they had been exposed to the implementation of the National Mathematics Program (NMP) and were considered capable of describing their experiences, perceptions, and learning behaviors related to Mathematics. The participants included both male and female learners officially enrolled during the current school year. Their grade levels were considered appropriate because learners at this stage receive more structured mathematics instruction and possess sufficient cognitive and reflective abilities to evaluate their attitudes toward Mathematics, engagement in learning activities, and perceived mathematical competence. Moreover, they had participated in mathematics interventions, instructional strategies, and assessment practices aligned with the objectives of the National Mathematics Program.

2.4 Sample and Sampling Procedure

The study employed a complete enumeration sampling technique, in which all eligible Grade 4 to Grade 6 learners who had experienced the implementation of the National Mathematics Program were included as respondents. This approach ensured comprehensive data collection and provided a broader representation of learners' perceptions and experiences regarding the implementation of the program across the participating schools. Including all qualified learners enhanced the completeness and reliability of the information gathered on learners' evaluation of the National Mathematics Program, their attitudes toward Mathematics, engagement in learning, and perceived mathematical competence.

2.5 Research Instrument

Data were collected using a structured survey questionnaire designed to assess the impact of the National Mathematics Program on learners' attitudes toward Mathematics, engagement in learning, perceived mathematical competence, and the challenges encountered during mathematics learning. The instrument was adapted from validated questionnaires and modified to suit the context of elementary learners. It consisted of two parts. The first part gathered respondents' demographic information, including optional name, sex, and grade level, while the second part measured learners' perceptions and experiences using a five-point Likert scale ranging from Strongly Agree (5) to Strongly Disagree (1). The program evaluation component measured learners' satisfaction, perceived usefulness, participation, and learning gains using indicators adapted from the EDUCATOOL instrument developed and psychometrically validated by Matolic et al. (2023), which demonstrated acceptable validity and reliability for educational program evaluation. The subscales measuring learners' attitudes toward Mathematics, engagement, and perceived mathematical competence were primarily adapted from the SATMAS instrument developed by Yáñez-Marquina and Villardón-Gallego (2016). Additional engagement indicators were adopted from Laranang and Bondoc (2020), while supplementary indicators for perceived mathematical competence were adapted from Özdemir and Önder-Özdemir (2017). The questionnaire also included items assessing challenges in mathematics learning, which were adapted from Rustam and Kosnin (2016) to identify the most frequently experienced learning barriers. The instrument was administered in classrooms under the researcher's supervision with assistance from teachers. Respondents received clear instructions, were encouraged to answer honestly and independently, and were assured that all responses would remain confidential and be used solely for research purposes.

2.6 Data Gathering Procedure

Data collection followed a systematic and ethical process. Before the conduct of the study, the researcher secured approval from the Schools Division Office through the district supervisor and obtained permission from the respective school principals of the selected public elementary schools in the northern part of the Fifth Congressional District of Cebu Province. Coordination was then made with school administrators and Mathematics teachers regarding the schedule, venue, and procedures for administering the survey. Prior to data collection, parental consent forms were distributed to all prospective respondents to ensure that parents or guardians were fully informed about the study's purpose, nature, and procedures. Only learners who returned signed consent forms and voluntarily agreed to participate were included in the study. This process ensured compliance with ethical standards involving minor participants, particularly with respect to informed consent, voluntary participation, confidentiality, and the protection of learners' rights. The researcher also finalized, reproduced, and reviewed the survey questionnaire to ensure that all items were appropriate, clear, and understandable for Grade 4 to Grade 6 learners. Before administering the instrument, the purpose of the study was explained, and respondents were assured that their identities would remain confidential and that the information collected would be used solely for academic research. The survey questionnaires were administered in the respondents' respective classrooms with the assistance of class advisers and Mathematics teachers. Clear instructions were provided to ensure proper understanding of each item, and learners were encouraged to answer honestly and independently based on their experiences and perceptions of Mathematics and the implementation of the National Mathematics Program. After the administration, the completed questionnaires were collected, checked for completeness, organized, coded, and prepared for data processing. The collected data were subsequently encoded, tabulated, and analyzed using appropriate statistical

procedures. The results served as the basis for interpreting the findings and developing policy recommendations to strengthen the implementation of the National Mathematics Program.

2.7 Data Analysis Techniques

The collected data were systematically organized, coded, and analyzed using both descriptive and inferential statistical techniques to address the research questions. Descriptive statistics, including frequency counts and percentages, were used to summarize the respondents' demographic characteristics by sex, grade level, and years of exposure to the National Mathematics Program. Weighted mean and standard deviation were computed to determine learners' evaluation of the National Mathematics Program, attitudes toward Mathematics in terms of self-concept, perceived usefulness, and interest, engagement in Mathematics learning, and perceived mathematical competence. Negatively worded statements were reverse-scored before analysis to ensure consistent interpretation, while the challenges encountered by learners were analyzed using frequency counts, percentages, and ranking to identify the most commonly experienced difficulties. Inferential statistical analyses were conducted using the Pearson Product-Moment Correlation Coefficient (Pearson r) to determine the relationships among learners' evaluation of the National Mathematics Program, attitudes toward Mathematics, engagement, and perceived mathematical competence. An independent-samples t-test was used to determine significant differences based on sex, while one-way Analysis of Variance (ANOVA) was employed to examine differences according to grade level and years of exposure to the National Mathematics Program. Post hoc tests were conducted when necessary to identify specific group differences. All inferential analyses were tested at the 0.05 level of significance, where a p-value of less than 0.05 indicated statistical significance and the rejection of the null hypothesis, while a p-value greater than 0.05 indicated failure to reject the null hypothesis.

3. Results and Discussion

3.1 Learners' Perceptions of the National Mathematics Program and Mathematics Learning

3.1.1 Respondents' Profile

The study involved 301 Key Stage 2 learners from selected public elementary schools. Most respondents were male (57.8%), while females comprised 42.2% of the sample. Grade 4 learners represented the largest group (41.9%), followed by Grade 5 (32.2%) and Grade 6 (25.9%), indicating greater participation from learners in the lower intermediate level. The demographic distribution provides important context for interpreting learners' attitudes, engagement, and perceived mathematical competence. Research indicates that differences in mathematics learning are more closely associated with confidence, motivation, and classroom participation than with gender itself (OECD, 2023; UNESCO, 2022; Wang & Degol, 2020). This finding is consistent with the gender similarities hypothesis, which suggests that males and females are generally more alike than different across most psychological characteristics, including academic abilities (Hyde, 2014). Likewise, the upper elementary years are considered critical for developing learners' academic self-concept, engagement, and long-term interest in mathematics (Boaler, 2022; Fredricks et al., 2021). These findings support the need for gender-responsive and developmentally appropriate implementation of the National Mathematics Program.

3.1.2 Learners' Evaluation of the National Mathematics Program

Learners generally expressed a neutral evaluation of the National Mathematics Program, obtaining an overall mean of 2.98, interpreted as "Neither Agree nor Disagree." They most strongly recognized the program's usefulness in supporting Mathematics learning, while indicators related to engagement, knowledge retention, skill application, and improvement in performance also remained within the neutral range, suggesting moderate learning gains but uncertainty regarding sustained outcomes. The findings suggest that learners recognize the value of the National Mathematics Program but perceive its implementation as needing further strengthening to achieve consistent learning outcomes. Learner-centered instruction, meaningful learning experiences, continuous reinforcement, and systematic monitoring have been identified as important factors in improving learner engagement, knowledge retention, and mathematics performance (OECD, 2023; Darling-Hammond et al., 2020; UNESCO, 2021; Guskey, 2020; Hattie, 2023; World Bank, 2021). This finding aligns with Hattie's synthesis of educational research, which highlights feedback, teacher effectiveness, and instructional quality as among the strongest influences on student achievement (Hattie, 2009).

3.1.3 Learners' Attitude toward Mathematics

Learners demonstrated an overall positive attitude toward Mathematics, reflected in a grand mean of 3.89 ("Agree"). They strongly recognized the usefulness of Mathematics in everyday life, society, and future careers, while their interest in Mathematics was generally positive. However, their mathematical self-concept remained neutral, indicating that many learners still experience self-doubt regarding their mathematical abilities despite recognizing the subject's importance. These findings indicate that learners value Mathematics and show interest in learning it, although greater support is needed to strengthen their confidence. Research likewise suggests that mathematical self-concept is strongly associated with achievement and persistence in Mathematics (Areepattamannil et al., 2021), while growth-oriented classroom practices encourage learners to embrace challenges and develop resilience (Boaler, 2016; Dweck, 2006). Mathematics self-concept influences motivation, persistence, and achievement (Boaler, 2022; Fredricks et al., 2021), while recognizing the usefulness

of Mathematics promotes sustained engagement (OECD, 2023). Interactive, learner-centered instruction also enhances learners' interest and emotional engagement (Darling-Hammond et al., 2020; National Council of Teachers of Mathematics, 2020). Therefore, the National Mathematics Program should continue providing supportive learning environments that strengthen learners' confidence and participation. Academic self-concept has consistently been identified as one of the strongest predictors of educational achievement (Marsh et al., 2021), while updated meta-analytic evidence further confirms that both self-concept and self-efficacy contribute substantially to students' academic success (Talsma et al., 2024).

3.1.4 Learners' Engagement in Mathematics

Learners demonstrated a moderate level of engagement in Mathematics, with an overall mean of 3.17, interpreted as "Neither Agree nor Disagree." They generally recognized the importance of Mathematics for their future careers, which received the highest rating, but remained uncertain about asking questions, performing well on tests, completing assignments, understanding mathematical concepts, and confidently applying Mathematics both inside and outside the classroom. These results indicate that learners participate in Mathematics learning but do not consistently exhibit strong confidence or active involvement. The findings reveal a gap between learners' recognition of the importance of Mathematics and their actual classroom engagement. Research explains that meaningful learning tasks and future-oriented goals enhance learner engagement (Eccles & Wigfield, 2020), while self-efficacy influences active participation (Wang et al., 2021). Engagement is further strengthened through behavioral, emotional, and cognitive participation supported by collaborative learning, constructive feedback, and growth-mindset practices (Fredricks et al., 2022; OECD, 2023; Skaalvik & Skaalvik, 2021). These findings suggest that the National Mathematics Program should strengthen learner-centered and confidence-building instructional approaches to encourage sustained participation in Mathematics learning. Recent studies likewise report that technology-supported mathematics instruction can significantly improve learner engagement when appropriately integrated into classroom teaching (Hwang et al., 2023). Furthermore, contemporary research shows that motivation and engagement remain closely interconnected in mathematics education (Núñez et al., 2024).

3.1.5 Learners' Perceived Mathematical Competence

Learners reported a moderate level of perceived mathematical competence, obtaining an overall mean of 3.20 ("Neither Agree nor Disagree"). They expressed relatively greater confidence in understanding mathematical concepts and working with numbers, while remaining uncertain about solving mathematical problems, performing operations, and applying higher-order thinking skills independently. These findings indicate that learners possess foundational mathematical understanding but remain unsure of their overall competence. The results suggest that learners' mathematical competence is still developing and requires continuous reinforcement. Competence beliefs improve through successful learning experiences and positive feedback (Skaalvik & Skaalvik, 2021), while conceptual understanding, self-efficacy, and expectancy-value beliefs significantly influence learners' motivation and achievement (OECD, 2023; Eccles & Wigfield, 2020). Scaffolded instruction, collaborative problem-solving, and formative assessment likewise contribute to stronger competence and learner confidence (Wang et al., 2021; Fredricks et al., 2022). These findings indicate that the National Mathematics Program should continue strengthening mastery-based and learner-centered instructional strategies. Learners' beliefs about their mathematical competence are also strongly associated with mathematics self-concept and achievement (Niu et al., 2021). Recent studies further demonstrate that learner engagement contributes positively to mathematical competence among elementary learners (Sovie et al., 2024).

3.2 Relationship Between the National Mathematics Program and Learners' Mathematical Learning

3.2.1 Relationship Between Program Implementation and Learners' Attitude, Engagement, and Perceived Mathematical Competence

The correlation analysis revealed significant relationships between the implementation of the National Mathematics Program and learners' mathematical self-concept ($r = -0.281$, $p < .001$), perceived usefulness ($r = -0.429$, $p < .001$), perceived mathematical competence ($r = 0.302$, $p < .001$), and engagement ($r = 0.579$ and $r = 0.596$, both $p < .001$). However, no significant relationship was found between program implementation and learners' interest in Mathematics ($r = -0.011$, $p = 0.850$). These findings indicate that stronger program implementation is associated with improved self-concept, greater recognition of the usefulness of Mathematics, higher engagement, and stronger perceived mathematical competence, although it does not necessarily increase learners' intrinsic interest in the subject. The findings demonstrate that effective implementation of the National Mathematics Program contributes positively to learners' confidence, engagement, and competence. Structured instructional support reduces negative learning perceptions and strengthens academic self-beliefs (Skaalvik & Skaalvik, 2021; OECD, 2023), while Expectancy-Value Theory explains that recognizing the usefulness of Mathematics enhances learners' commitment to learning (Eccles & Wigfield, 2020). Nevertheless, developing learners' interest requires engaging instructional strategies, autonomy support, and meaningful classroom experiences (Hidi & Renninger, 2020). Consistent with previous studies, learner engagement remains a strong predictor of achievement because active participation promotes persistence and deeper learning (Fredricks et al., 2021; Wang & Eccles, 2021). These findings emphasize the importance of combining effective program implementation with

learner-centered pedagogy and supportive classroom environments to maximize the impact of the National Mathematics Program.

3.3 Differences in Learners' Evaluation of the National Mathematics Program

3.3.1 Differences in Program Evaluation According to Sex

Male learners obtained a mean program evaluation score of 2.872, while female learners obtained a slightly higher mean of 3.142. However, the computed t-value (1.768) was lower than the critical value (1.970) at the 0.05 level of significance, indicating no significant difference in program evaluation between male and female learners. These findings show that both groups share comparable perceptions regarding the effectiveness, usefulness, and implementation of the National Mathematics Program. The absence of a significant difference suggests that the National Mathematics Program provides relatively equitable instructional support and learning opportunities regardless of learners' sex. Educational research indicates that differences in mathematics perceptions are influenced more by classroom context, teaching quality, and learning support than by inherent gender differences (OECD, 2023). Likewise, Expectancy-Value Theory explains that learners' perceptions are shaped primarily by perceived usefulness, engagement opportunities, and learning experiences rather than demographic characteristics (Eccles & Wigfield, 2020). These findings imply that improving instructional quality and supportive classroom environments benefits all learners without requiring gender-specific interventions.

3.3.2 Differences in Program Evaluation According to Grade Level

The analysis of variance revealed a significant difference in learners' evaluation of the National Mathematics Program across grade levels ($F = 46.644$, $p = 0.000$). This result indicates that learners in Grades 4, 5, and 6 differed significantly in how they perceived the effectiveness and implementation of the program, suggesting that program evaluation changes as learners progress through the intermediate grades. The findings indicate that learners' perceptions are influenced by differences in cognitive development, academic exposure, and learning experiences across grade levels. As learners advance, they encounter more complex mathematical concepts and higher learning expectations that shape their evaluation of instructional programs. Developmental and motivational theories explain that learners' attitudes and perceptions evolve as they gain greater autonomy and responsibility for learning (Eccles & Wigfield, 2020). Research also emphasizes that instructional programs should be developmentally responsive by providing age-appropriate learning experiences, scaffolded instruction, and meaningful problem-solving opportunities (UNESCO, 2021; OECD, 2023). These findings support the need for grade-level-responsive implementation strategies within the National Mathematics Program.

3.3.3 Post Hoc Analysis of Grade-Level Differences

The post hoc analysis showed no significant difference between Grade 4 and Grade 5 learners ($p = 0.325$), indicating similar perceptions of the National Mathematics Program. In contrast, significant differences were found between Grade 4 and Grade 6 learners (Mean Difference = -1.55846 , $p < .001$) and between Grade 5 and Grade 6 learners (Mean Difference = -1.29191 , $p < .001$). These results indicate that Grade 6 learners evaluated the program differently from learners in the lower grade levels, suggesting that perceptions of program effectiveness change as learners advance academically. The observed differences may be attributed to learners' increasing cognitive maturity, academic expectations, and exposure to more advanced mathematical concepts. As learners progress through the intermediate grades, they develop stronger evaluative judgment and become more critical of instructional experiences. Developmental and motivational theories explain that academic perceptions evolve with cognitive development and self-regulation (Eccles & Wigfield, 2020). Likewise, international studies emphasize that instructional interventions should remain responsive to learners' developmental needs because engagement, motivation, and perceived effectiveness vary across grade levels (OECD, 2023; UNESCO, 2021). These findings suggest that the National Mathematics Program should adopt differentiated instructional approaches and grade-sensitive implementation strategies to ensure meaningful learning experiences across all intermediate grade levels.

3.4 Challenges Encountered in the Implementation of the National Mathematics Program

3.4.1 Learners' Challenges in Mathematics Learning

The findings revealed that the most common challenges experienced by learners were confusion with Mathematics lessons (96.36%), difficulty understanding Mathematics lessons (86.23%), and difficulty completing Mathematics activities (72.47%). Many learners also reported difficulty understanding mathematical concepts (68.02%) and performing well in tests or quizzes (64.78%). Although boredom during Mathematics classes was moderately reported (54.25%), home-related concerns, including limited study assistance, dislike of Mathematics, lack of reference materials, and household responsibilities, were reported less frequently. Overall, the results indicate that learners' primary difficulties are instructional and cognitive rather than environmental or home-related. Recent studies emphasize that mathematics learning difficulties are commonly associated with gaps in conceptual understanding and can be addressed through learner-centered instruction, differentiated teaching strategies, and targeted intervention programs (OECD, 2023; UNESCO, 2022). Mathematics anxiety and negative achievement emotions also reduce learners' confidence and performance in Mathematics (Putwain et al., 2022; Ramirez et al., 2021; Lee & Hannula, 2022). Strengthening instructional strategies, providing timely remediation, and enhancing school-home collaboration through meaningful parental involvement (Hill & Tyson, 2009)

may therefore improve learners' mathematical competence and support the effective implementation of the National Mathematics Program (World Bank, 2021).

4. Conclusion & Recommendations

The study concludes that the implementation of the National Mathematics Program contributes to learners' attitudes, engagement, and perceived mathematical competence; however, its impact remains moderate and requires further strengthening. Although learners recognized the importance and usefulness of Mathematics and demonstrated positive attitudes toward the subject, their self-concept, engagement, and perceived mathematical competence were still developing. The findings further confirmed significant relationships between program implementation and learners' attitudes, engagement, and perceived mathematical competence, while differences across grade levels indicate that learners' developmental stages influence their experiences with the program. The instructional and cognitive challenges encountered by learners emphasize the need for more consistent, learner-centered, and responsive implementation to enhance mathematics learning outcomes.

The study recommends strengthening the implementation of the National Mathematics Program through continuous monitoring, technical assistance, and adequate instructional resources. Mathematics teachers should adopt learner-centered and differentiated instructional approaches that build learners' confidence, reduce mathematics anxiety, and encourage active participation. Curriculum developers and program coordinators should enhance learning materials, scaffolded activities, and intervention programs to address learners' developmental needs, while parents and guardians should provide consistent academic support at home. Learners should likewise be encouraged to participate actively in mathematics activities, seek assistance when needed, and develop positive study habits to improve their engagement and mathematical competence.

This study was limited to Grade 4 to Grade 6 learners from selected public elementary schools in the northern part of the Fifth Congressional District, with findings based on learners' self-reported perceptions of the National Mathematics Program, their attitudes, engagement, and perceived mathematical competence. The results reflect the participants' experiences within the study setting and period and therefore provide evidence specific to the context examined.

Compliance with ethical standards

The study was conducted in accordance with established ethical principles for educational research involving human participants. Permission to conduct the study was obtained from the appropriate educational authorities and participating schools before data collection. Participation was voluntary, with written parental consent obtained for all participating learners. Respondents were informed of the purpose and procedures of the study, and their identities and responses were kept confidential. All information collected was used solely for academic research, and the rights, privacy, and welfare of the participants were respected throughout the conduct of the study.

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