

Effectiveness of the School-Based Intervention Program on Learners' Literacy and Numeracy Skills Development as Perceived by Teachers

Rossana V. Trabado

Dominador D. Trabado Elementary School, Masbate, Philippines

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Email of Corresponding Author: rossana.trabado01@deped.gov.ph

Abstract

This study examined the effectiveness of the School-Based Intervention Program on learners' literacy and numeracy skills development in Milagros, Masbate, as perceived by teachers. Anchored on Bruner's Constructivist Learning Theory, Vygotsky's Social Constructivist Theory, and the Response to Intervention Framework of Fuchs and Fuchs, the study employed a quantitative descriptive-correlational research design. Using convenience sampling, the study surveyed 50 teacher-respondents through a researcher-made and expert-validated questionnaire using a four-point Likert scale. Data were analyzed using frequency count, percentage, weighted mean, ranking, and one-way ANOVA at the 0.05 level of significance. Findings showed that the School-Based Intervention Program was highly effective in improving learners' literacy skills, particularly reading comprehension, vocabulary acquisition, writing skills, and fluency. It was also highly effective in strengthening numeracy skills, including basic computation, problem-solving, number sense, and application of mathematical concepts. The overall program was rated highly effective in terms of implementation and delivery, appropriateness of strategies and materials, monitoring and evaluation, and impact on learners' academic improvement. The ANOVA result showed no significant difference in teachers' perceptions based on demographic profile, as the computed F-value of 0.706 was lower than the critical F-value of 2.579 and the p-value of 0.592 was greater than 0.05. The study concluded that the program effectively supports learners' academic growth and recommended sustained school support, improved instructional materials, regular monitoring, professional development, and stronger focus on higher-order literacy skills and contextualized numeracy activities. The study supports SDG 4, Quality Education, and SDG 17, Partnerships for the Goals, by promoting foundational learning and collaboration among teachers, school leaders, administrators, parents, and education stakeholders. Its sustainability impact lies in strengthening educational, institutional, professional, and community support systems for literacy and numeracy development.

Keywords: Academic Improvement, Intervention Strategies, Literacy Skills, Monitoring and Evaluation, Numeracy Skills, School-Based Intervention Program, Teacher Perceptions

1. Introduction

Education is essential in developing learners' literacy and numeracy skills, which serve as foundations for academic success and lifelong learning. This study examines the effectiveness of the School-Based Intervention Program on learners' literacy and numeracy skills development in Milagros, Masbate, as perceived by teachers. It focuses on literacy skills such as reading comprehension, vocabulary acquisition, writing skills, and fluency, and numeracy skills such as basic computation, problem-solving, number sense, and application of concepts. It also evaluates the program's implementation, strategies and materials, monitoring and evaluation, and impact on learners' academic improvement.

1.1 School-Based Intervention Program for Learners' Literacy and Numeracy Skills Development

School-Based Intervention Programs provide structured and targeted support for learners who need assistance in literacy and numeracy. Their effectiveness depends on teacher participation, professional development, instructional competence, learner motivation, socioemotional support, parental involvement, and culturally responsive instruction. Lerum et al. (2019) emphasized that teachers' active participation and positive perceptions sustain intervention programs, while Sum et al. (2022) revealed that continuous professional development enhances students' motivation and learning outcomes. Joshi (2023) highlighted that teachers' self-efficacy and pedagogical knowledge improve instructional delivery, while Vo and Allen (2022) noted that teacher well-being contributes to effective program implementation. Chiappetta-Santana et al. (2022) found that learners' motivation and socioemotional skills influence academic achievement. Kigobe (2019) emphasized parental involvement, while Davis (2023), Holloman (2022), Husband & Kang (2020), and Jones (2019) showed that culturally responsive teaching and professional collaboration improve literacy outcomes. Stevenson (2014) and Croom (2018) further emphasized cultural awareness in instruction. These findings align with Department of Education policies on learning recovery, literacy and numeracy development, reading interventions, and teacher professional development (Department of Education, 2015, 2016, 2019, 2022), which support literacy and numeracy development,

intensive reading interventions, learning recovery, and teacher professional collaboration. Programs such as the National Reading Program, Every Child a Reader Program, and the National Learning Camp or ARAL Program further strengthen school-based literacy and numeracy interventions.

1.2 Related Literature and Studies on Literacy, Numeracy, and School-Based Intervention Effectiveness

Foreign studies show that structured school-based interventions improve reading and mathematics outcomes, especially among struggling learners. Dietrichson et al. (2021) found that reading and mathematics interventions produce positive academic results, while Aunio et al. (2021) and Aunio (2019) emphasized early numeracy interventions. Cahoon et al. (2024) showed that school- and home-based interventions enhance early literacy and numeracy. Nash et al. (2021) and Alam (2022) linked school-based interventions to holistic learner development, while Alahmari (2019) and Charlton et al. (2021) highlighted structured frameworks and schoolwide programs. Ryan et al. (2022), Peralta et al. (2022), and Edwards et al. (2019) emphasized teacher training, while Karr et al. (2022), Moorer (2021), and Kelly et al. (2021) stressed inclusive, culturally responsive, and foundational interventions. Local literature also emphasizes structured interventions, teacher engagement, parental involvement, and continuous improvement. Santillan (2023) and Huguerra & Cacho (2022) identified literacy challenges requiring stronger reading interventions. Bañez & Urayan (2019) and Jambangan (2024) showed that structured reading remediation improves reading performance. Dolba (2024) and Carillo & Janer (2022) highlighted teacher practices and involvement. In numeracy, Munda et al. (2024), Legal & Legal (2024), and Gaspar (2023) showed that targeted and contextualized instruction improves mathematical skills. Fernandez et al. (n.d.), Cahoon et al. (2024), and Gaviño & Chua (2022) emphasized parental support and school-home interventions. Department of Education (2022), Del Rosario (2021), Superioridad (2024), Alvarado and Galigao (2024), and Balais (n.d.) further support structured programs, teacher development, curriculum implementation, and continuous program improvement. Related studies confirm that school-based interventions are strengthened by teacher professional development, technology integration, parental involvement, and supportive school environments. Dietrichson et al. (2020), Gupta & Lee (2020), Medina et al. (2021), Ke et al. (2019), Wambugu et al. (2019), Vera et al. (2022), Bippert (2019), and Collins et al. (2022) found that targeted interventions and professional development improve literacy, instruction, and engagement. Egan et al. (2019), DuPaul et al. (2021), Katz et al. (2020), Cefai et al. (2022), Kelly et al. (2021), Zhao et al. (2024), and Cristóvão et al. (2020) further show that interventions support academic, behavioral, socio-emotional, and holistic learner development. In the Philippine context, Decena (2021), Librea et al. (2023), Rebollos & Rebollos (2024), and Inoferio & Revalde (2024) reported persistent literacy challenges. Lim (2024), Hernandez (2024), Sandicho and Padilla (2022), Acedillo (2023), Rafanan and Raymundo (2024), and Joaquin and Imbat (2024) showed that reading programs, parental involvement, contextualized materials, remediation, and game-based pedagogy improve reading outcomes. Bernardo et al. (2021) and Gagabe (n.d.) emphasized motivation and school-based management, while Mendiola & Estonanto (2022), Estrada (2023), Morata and Caballes (2024), Lavador et al. (2024), and Igarashi and Suryadarma (2023) highlighted instructional materials, problem-solving interventions, digital game-based learning, early foundational skills, and persistent learning gaps.

1.3 Implementation Context of the School-Based Intervention Program in Milagros, Masbate

School-based interventions are used globally to address literacy, numeracy, socio-emotional, and academic learning needs. In the Philippines, DepEd supports learning recovery through programs such as the National Reading Program, Every Child a Reader Program, Early Language, Literacy, and Numeracy Program, Bawat Bata Bumabasa, Brigada Pagbasa, and the National Learning Camp. This study is situated in Milagros, Masbate. Masbate is an island province composed of Masbate, Ticao, and Burias and is politically part of the Bicol Region. Milagros is one of the municipalities of Masbate and is described as the largest municipality in the province in terms of land area. It has 27 barangays and is served by the Milagros East Schools District and Milagros West Schools District, which oversee public and private schools from primary to secondary levels. This local context supports the need to assess how School-Based Intervention Programs are implemented in Milagros schools.

1.4 Theoretical and Conceptual Foundations of Literacy and Numeracy Intervention

This study is anchored on Constructivist Learning Theory by Bruner (1961), Social Constructivist Theory by Vygotsky (1978), and the Response to Intervention Framework by Fuchs & Fuchs (2006). Bruner (1961) explains that learners actively construct knowledge through experiences and interaction with their environment. Vygotsky (1978) emphasizes learning through social interaction, scaffolding, and guidance from more knowledgeable individuals. Fuchs and Fuchs (2006) focus on early identification of learning difficulties and the provision of tiered, targeted support. The study uses the Input-Process-Output approach. The input includes teachers' demographic profiles and their perceptions of program effectiveness in literacy, numeracy, implementation, strategies and materials, monitoring and evaluation, and academic improvement. The process involves survey questionnaires, data gathering, analysis, and interpretation using percentage, weighted mean, and one-way ANOVA. The output includes the determined level of program effectiveness and whether teachers' perceptions differ according to demographic profile.

1.5 Research Gap and Rationale for Assessing Teacher-Perceived Program Effectiveness

Although previous studies show that school-based interventions improve literacy and numeracy, many focus only on specific programs, isolated outcomes, or learner performance data. Limited research evaluates these programs comprehensively in terms of implementation, strategies and materials, monitoring and evaluation, overall impact, and teacher perceptions. This study addresses that gap by assessing the effectiveness of the School-Based Intervention Program on learners' literacy and numeracy skills development as perceived by teachers in Milagros, Masbate. Specifically, the study determines the teacher-respondents' profile, the effectiveness of the program in improving literacy and numeracy skills, the overall effectiveness of the program, and whether significant differences exist in teachers' perceptions based on demographic profile. It assumes that teachers have sufficient involvement and knowledge to provide reliable perceptions and that learners exposed to interventions show observable improvement in literacy and numeracy.

1.6 Alignment of the School-Based Intervention Program with Relevant Sustainable Development Goals (SDGs)

This study aligns primarily with SDG 4 – Quality Education because it focuses on improving learners' literacy and numeracy through structured school-based interventions. It supports foundational learning, academic improvement, instructional enhancement, and learning recovery. The study also aligns with SDG 17 – Partnerships for the Goals because it recognizes the roles of teachers, parents, school heads, administrators, policy makers, DepEd, and future researchers in strengthening literacy and numeracy programs. SDG 3 – Good Health and Well-Being is indirectly related because some reviewed studies link school-based interventions with learner well-being, socio-emotional development, and holistic support.

1.7 Contribution of Literacy and Numeracy Intervention to Multidisciplinary Sustainability

The study contributes to educational sustainability by supporting improvements in School-Based Intervention Programs that address foundational literacy and numeracy needs. Strengthening these skills promotes lifelong learning, academic progression, and learner readiness for future education. It also supports institutional sustainability by helping teachers, school heads, administrators, and DepEd improve program implementation, instructional strategies, monitoring, and evaluation. It contributes to community and socio-economic sustainability by encouraging parent-school collaboration and improving learners' capacity to participate productively in school and community life. Since the study focuses on teacher perceptions, it also supports professional sustainability through reflective practice, teacher capacity building, and improved instructional decision-making.

1.8 Scope, Delimitation, and Hypotheses of the School-Based Intervention Program Study

The study is limited to selected teachers from five schools in Milagros, Masbate who are directly involved in implementing the School-Based Intervention Program. It focuses only on teachers' perceptions and does not include actual learner performance scores or the perceptions of students, parents, or school administrators. It is also limited to the current implementation period. The study tests two hypotheses: first, that there is no significant difference in teachers' perceptions of the intervention program's overall effectiveness based on their demographic profile; and second, that there is a significant difference in teachers' perceptions of the intervention program's overall effectiveness based on their demographic profile.

2. Material and methods

2.1 Research Design

This study employed a quantitative descriptive-correlational research design to determine the effectiveness of the School-Based Intervention Program on learners' literacy and numeracy skills development in Milagros, Masbate. The descriptive component was used to describe the respondents' demographic profile and assess teachers' perceptions of the intervention program's effectiveness in improving literacy and numeracy skills. The correlational component examined whether significant differences existed in teachers' perceptions based on their demographic profile. The study assessed literacy skills in terms of reading comprehension, vocabulary acquisition, writing skills, and fluency, and numeracy skills in terms of basic computation, problem-solving, number sense, and application of concepts. It also evaluated the program's overall effectiveness in terms of implementation and delivery, appropriateness of intervention strategies and materials, monitoring and evaluation processes, and impact on learners' academic improvement. According to Creswell & Creswell (2018)¹, quantitative descriptive research designs are appropriate for systematically describing existing conditions and perceptions, while correlational designs determine the degree of relationship between variables. Ary et al. (2019)² similarly emphasized that descriptive-correlational research is appropriate in educational and social research when describing variables and examining associations without manipulation.

2.2 Locale of the Study

The study was conducted in Milagros, Masbate, particularly among teachers in Milagros South District. The locale was selected because it was directly relevant to the implementation of the School-Based Intervention Program on learners' literacy and numeracy skills development.

2.3 Respondents of the Study

The respondents of the study were teachers in Milagros, Masbate who were involved in or knowledgeable about the School-Based Intervention Program. The manuscript states that the researcher surveyed thirty (50) respondents consisting of teachers in Milagros, Masbate.

2.4 Sample and Sampling Procedure

The study used convenience sampling to select the respondents. This method was used because it allowed the researcher to gather data efficiently from teachers who were readily accessible, available during the data collection period, willing to participate, and relevant to the objectives of the study. Although convenience sampling does not ensure a fully representative sample, it provided useful insights from individuals directly involved in the context being examined.

2.5 Research Instrument

The primary data-gathering instrument was a researcher-made survey questionnaire designed to determine the effectiveness of the School-Based Intervention Program on learners' literacy and numeracy skills development as perceived by teachers. The questionnaire was organized according to the research questions and included items on the respondents' demographic profile, the effectiveness of the program in improving literacy skills, the effectiveness of the program in improving numeracy skills, and the overall effectiveness of the School-Based Intervention Program. The first part gathered the demographic profile of the teacher-respondents in terms of age, sex, teaching experience, grade level taught, and subject specialization. The second part measured literacy skills in terms of reading comprehension, vocabulary acquisition, writing skills, and fluency. The third part assessed numeracy skills in terms of basic computation, problem-solving, number sense, and application of concepts. The fourth part measured the overall effectiveness of the program in terms of implementation and delivery, appropriateness of intervention strategies and materials, monitoring and evaluation processes, and impact on learners' academic improvement. The questionnaire used a four-point Likert scale with the following interpretations: 4 as Highly Effective, 3 as Effective, 2 as Less Effective, and 1 as Not Effective. Prior to administration, the instrument underwent content validation by experts in education, social work, and research methodology to ensure clarity, relevance, and alignment with the study objectives. Their comments and suggestions were incorporated to improve the wording, sequencing, and organization of the items.

2.6 Data Gathering Procedure

The research process followed a systematic procedure. The researcher first submitted a research capsule to the adviser for review and approval, including the proposed title, statement of the problem, theoretical background, respondents and sampling plan, research design, and possible sources of data. After approval, the researcher developed the structured questionnaire and subjected it to expert validation. Revisions were made based on the validators' comments before the instrument was finalized. A permission letter noted by the adviser was submitted to the Office of the Schools Division Superintendent for approval. Once permission was granted, the researcher personally administered the validated questionnaires to the selected respondents. Clear instructions were provided to ensure proper understanding, and the accomplished questionnaires were retrieved on the same day, resulting in a 100% retrieval rate. The responses were then encoded, recorded, tabulated, and prepared for statistical analysis with the assistance of an expert statistician.

2.7 Data Analysis Techniques

The gathered data were analyzed using frequency count, percentage, weighted mean, ranking, and one-way ANOVA. Frequency count and percentage were used to describe the demographic profile of the respondents. Weighted mean and ranking were used to determine the level of effectiveness of the intervention program in improving learners' literacy and numeracy skills, as well as the overall effectiveness of the School-Based Intervention Program as perceived by teachers. One-way ANOVA was used to determine whether significant differences existed in teachers' perceptions of the intervention program's overall effectiveness based on their demographic profile. The test was conducted at the 0.05 level of significance. If the computed F-value was greater than the critical F-value, the null hypothesis was rejected, indicating a significant difference between groups. If the computed F-value was less than or equal to the tabulated F-value, the null hypothesis was accepted, indicating no significant difference between groups.

3. Results and Discussion

3.1 Demographic Profile of the Teachers

3.1.1 Age Profile of the Teachers

The results showed that the teacher-respondents were mostly within the 26–40 age range. The age groups 26–30, 31–35, and 36–40 each had 13 respondents or 26.00%, while 11 respondents or 22.00% were 41 years old and above. No respondent was 25 years old and below. This indicates that the teaching workforce is mostly composed of mid-career teachers, with some older and more experienced teachers also represented. This suggests a balance of professional energy and teaching experience. This finding is supported by Ke et al. (2019), who found that teachers with more teaching

experience demonstrate higher teaching efficacy and more effective instructional strategies, which positively influence learner outcomes.

3.1.2 Sex Profile of the Teachers

The results revealed that 30 teachers or 60.00% were female, while 20 teachers or 40.00% were male. This shows that the respondents were predominantly female, although male teachers were also substantially represented. This finding reflects the common trend of female dominance in the teaching profession while still showing gender diversity among teachers. The result suggests that the effectiveness of intervention programs is not dependent on sex but on instructional practices. This is consistent with Egan et al. (2019), who emphasized that teachers, regardless of gender, share similar preferences for structured school-based interventions.

3.1.3 Teaching Experience of the Teachers

The results showed that 17 teachers or 34.00% had 6–10 years of teaching experience, followed by 16 teachers or 32.00% with 11–15 years, 9 teachers or 18.00% with 16 years and above, and 8 teachers or 16.00% with 0–5 years of experience. This indicates that most respondents had moderate to extensive teaching experience, particularly within the 6–15-year range. Such experience suggests that teachers have developed instructional and classroom management skills that can support effective intervention delivery. This supports Medina et al. (2021), who revealed that teachers with sustained experience and professional development are more effective in implementing reading strategies, thereby improving learners' literacy skills.

3.1.4 Grade Level Taught by the Teachers

The findings showed that Grade 5 had the highest number of teacher-respondents, with 10 teachers or 20.00%. Grades 3, 4, and 6 each had 7 teachers or 14.00%, K–1 had 6 teachers or 12.00%, Grades 1 and 2 each had 5 teachers or 10.00%, and K–2 had 3 teachers or 6.00%. This shows a relatively balanced distribution of teachers across grade levels, although Grade 5 had the highest representation. The distribution suggests that intervention implementation covers various grade levels and may respond to different learner needs. This aligns with Dietrichson et al. (2020), who emphasized that intervention programs across different grade levels significantly improve reading and mathematics outcomes when properly distributed and implemented.

3.1.5 Subject Specialization of the Teachers

The results showed that most respondents were General Education teachers, with 35 teachers or 70.00%. This was followed by Pre-school with 4 teachers or 8.00%, Mathematics with 3 teachers or 6.00%, English/Language Arts, Filipino, and MAPEH with 2 teachers or 4.00% each, and Science and MTB-MLE with 1 teacher or 2.00% each. No respondents specialized in Araling Panlipunan, ESP, or SPED. This suggests that most teachers handle multiple subjects, which is common in elementary education. However, the limited number of subject specialists may indicate the need for further professional development to strengthen subject-specific expertise. This is supported by Gupta and Lee (2020), who found that teacher effectiveness improves through site-based professional development, even among generalist teachers, leading to better student learning outcomes.

3.2 Effectiveness of the Intervention Program in Improving Learners' Literacy Skills

3.2.1 Reading Comprehension

The results showed that the intervention program was highly effective in improving learners' reading comprehension, with an overall weighted mean of 3.37. The highest-rated indicators were the provision of suitable reading materials for learners' levels and the enhancement of comprehension across reading genres, both with a weighted mean of 3.50. The lowest-rated indicator was learners' ability to make inferences and draw conclusions accurately, with a weighted mean of 3.16, although it was still interpreted as effective. This indicates that the program supports learners' comprehension development, especially through appropriate reading materials and varied reading activities. However, higher-order comprehension skills such as inference-making and drawing conclusions may still need strengthening. This supports Acedillo (2023), who found that contextualized learning materials improve reading comprehension, and Rafanan & Raymundo (2024), who confirmed that reading interventions enhance fluency and understanding.

3.2.2 Vocabulary Acquisition

The findings showed that the intervention program was highly effective in improving vocabulary acquisition, with an overall weighted mean of 3.50. All indicators were rated highly effective, with vocabulary lessons aligned with literacy objectives receiving the highest weighted mean of 3.54. The lowest-rated indicator was learners' ability to determine word meanings through context, with a weighted mean of 3.46. This suggests that the program effectively supports learners' word knowledge, word use, and vocabulary development through aligned and engaging activities. The slightly lower rating for determining meanings through context suggests the need for continued practice in contextual vocabulary skills. This is consistent with Joaquin and Imbat (2024), who emphasized that engaging strategies such as game-based learning improve vocabulary acquisition and comprehension.

3.2.3 Writing Skills

The results showed that the program was highly effective in improving writing skills, with an overall weighted mean of 3.44. The highest-rated indicator was enhancing spelling and sentence formation, with a weighted mean of 3.50. Organizing ideas clearly, developing correct grammar and structure, and improving creativity and expression all received a weighted mean of 3.44. The lowest-rated indicator was learners' ability to compose short paragraphs or essays, with a weighted mean of 3.40. This indicates that the intervention program strengthens basic writing competencies, particularly spelling and sentence construction. However, paragraph and essay writing may require further instructional support to enhance extended written expression. This is supported by Del Rosario (2021), who emphasized that structured literacy frameworks improve writing and overall language development.

3.2.4 Fluency

The findings showed that the program was highly effective in improving fluency, with an overall weighted mean of 3.42. The highest-rated indicator was enhancing reading speed and accuracy, with a weighted mean of 3.48. Developing learners' confidence in reading aloud received a weighted mean of 3.42, while smooth reading, repeated reading activities, and expression and phrasing each received a weighted mean of 3.40. This indicates that the intervention program helps learners improve accuracy, speed, and confidence in reading. The results suggest that repeated and guided reading activities contribute to fluency development. This aligns with Bañez and Urayan (2019), who found that structured reading interventions enhance fluency, pronunciation, and reading confidence among learners.

3.3 Effectiveness of the Intervention Program in Improving Learners' Numeracy Skills

3.3.1 Basic Computation

The results showed that the intervention program was highly effective in improving basic computation, with an overall weighted mean of 3.41. The highest-rated indicator was the use of drills appropriate to learners' levels, with a weighted mean of 3.58. Accurate performance in basic operations and improvement in arithmetic mastery both received a weighted mean of 3.40, while learners' confidence in performing computations independently had the lowest weighted mean of 3.30. This indicates that the program effectively develops learners' computation skills through level-appropriate drills and arithmetic practice. However, learners' confidence in independent computation may still be strengthened. This supports Munda et al. (2024), who found that structured numeracy programs like Project COUNTS significantly improve computation skills.

3.3.2 Problem-Solving

The findings showed that the program was highly effective in improving problem-solving skills, with an overall weighted mean of 3.45. The highest-rated indicator was the integration of real-life problem scenarios, with a weighted mean of 3.54. The improvement of learners' ability to select correct operations and apply multiple strategies both received a weighted mean of 3.46, while interpreting and analyzing word problems correctly had the lowest weighted mean of 3.36. This suggests that real-life and strategy-based activities help improve learners' problem-solving ability. However, additional support may be needed in analyzing and interpreting word problems. This is consistent with Estrada (2023), who revealed that intervention programs improve students' mathematical problem-solving abilities.

3.3.3 Number Sense

The results showed that the intervention program was highly effective in developing number sense, with an overall weighted mean of 3.44. The highest-rated indicator was enhancing learners' understanding of place value and patterns, with a weighted mean of 3.52. Understanding relationships among whole numbers and estimating and comparing numbers both received a weighted mean of 3.44, while identifying numerical patterns and sequences had the lowest weighted mean of 3.38. This indicates that the program supports learners' conceptual understanding of numbers, particularly place value and number relationships. However, recognizing numerical patterns and sequences may need further emphasis. This supports Lavador et al. (2024), who emphasized that early numeracy development strengthens learners' understanding of numbers and patterns.

3.3.4 Application of Mathematical Concepts

The findings showed that the program was highly effective in helping learners apply mathematical concepts, with an overall weighted mean of 3.47. The highest-rated indicator was encouraging connections between old and new lessons, with a weighted mean of 3.50. Applying concepts in daily life situations and fostering mastery through hands-on and contextual activities both received a weighted mean of 3.48, while improved accuracy in applying learned concepts had the lowest weighted mean of 3.42. This indicates that the intervention program helps learners connect mathematical concepts to practical and meaningful contexts. However, accuracy in applying learned concepts may still benefit from continued reinforcement. This aligns with Morata & Caballes (2024), who found that innovative teaching strategies improve the application of mathematical concepts among learners.

3.4 Overall Effectiveness of the School-Based Intervention Program

3.4.1 Implementation and Delivery

The results showed that the program was highly effective in terms of implementation and delivery, with an overall weighted mean of 3.50. The highest-rated indicator was implementation according to schedule and guidelines, with a weighted mean of 3.58. Teacher training and alignment with school goals both received a weighted mean of 3.50, while the provision of sufficient resources and materials had the lowest weighted mean of 3.44. This suggests that the program is generally well implemented and aligned with school literacy and numeracy goals. However, the availability of resources and materials may still be improved to strengthen implementation quality. This supports Carillo & Janer (2022), who emphasized that teacher involvement strengthens program implementation and effectiveness.

3.4.2 Appropriateness of Intervention Strategies and Materials

The findings showed that the intervention strategies and materials were highly effective, with an overall weighted mean of 3.52. The highest-rated indicators were the alignment of learning resources with curriculum standards and the effectiveness of strategies in addressing learners' literacy and numeracy difficulties, both with a weighted mean of 3.56. Responsiveness to diverse learning needs had the lowest weighted mean of 3.46. This indicates that the strategies and materials used in the program are generally appropriate, curriculum-aligned, and responsive to learners' needs. The lower rating for addressing diverse learning needs suggests that further differentiation may enhance the program. This is supported by Mendiola & Estonanto (2022), who found that appropriate instructional materials enhance teaching effectiveness and learner outcomes.

3.4.3 Monitoring and Evaluation Processes

The results showed that monitoring and evaluation processes were highly effective, with an overall weighted mean of 3.53. The highest-rated indicator was the regular tracking of learners' progress through assessments, with a weighted mean of 3.60. Accurate evaluation tools received a weighted mean of 3.58, while periodic reviews of program outcomes had the lowest weighted mean of 3.46. This indicates that the program has a strong monitoring system that supports the tracking of learners' progress and the use of assessment data. However, periodic review of outcomes may be strengthened to further improve program refinement and sustainability.

3.4.4 Impact on Learners' Academic Improvement

The findings showed that the program had a highly effective impact on learners' academic improvement, with an overall weighted mean of 3.54. The highest-rated indicator was the program's positive contribution to overall school performance, with a weighted mean of 3.60. Reduction of learning gaps received a weighted mean of 3.56, increased motivation and confidence received 3.54, improved academic achievement received 3.52, and improvement in literacy and numeracy performance received 3.50. This indicates that the intervention program positively contributes to learners' academic growth, motivation, confidence, and overall school performance. The results suggest that the program supports both cognitive and motivational aspects of learning. This supports Cahoon et al. (2024), who found that both school-based and home-based interventions significantly improve literacy and numeracy outcomes.

3.5 Significant Difference in Teachers' Perceptions Based on Demographic Profile

The ANOVA results showed a computed F-value of 0.706, which was lower than the critical F-value of 2.579 at the 0.05 level of significance. The computed p-value of 0.592 was greater than 0.05; therefore, the null hypothesis was accepted. This means that there was no significant difference in teachers' perceptions of the intervention program's overall effectiveness based on demographic profile. This result indicates that teachers had similar perceptions of the program's effectiveness regardless of age, sex, teaching experience, grade level taught, and subject specialization. It suggests that the program was perceived consistently in terms of implementation and delivery, appropriateness of intervention strategies and materials, monitoring and evaluation processes, and impact on learners' academic improvement.

4. Conclusion & Recommendations

The study concluded that the School-Based Intervention Program was highly effective in improving learners' literacy and numeracy skills in Milagros, Masbate. The respondents were mostly female teachers aged 26–40 years old, with 6–15 years of teaching experience, and the majority were General Education teachers. The literacy component was rated highly effective in improving reading comprehension, vocabulary acquisition, writing skills, and fluency, particularly through suitable reading materials and engaging vocabulary activities. The numeracy component was likewise rated highly effective in strengthening basic computation, problem-solving, number sense, and application of mathematical concepts, especially through appropriate drills and real-life problem-solving tasks. The overall program was also highly effective in terms of implementation and delivery, appropriateness of strategies and materials, monitoring and evaluation, and impact on learners' academic improvement. Since the computed F-value of 0.706 was lower than the critical F-value of 2.579 and the p-value of 0.592 was greater than 0.05, teachers' demographic profile did not significantly influence their perceptions of the program's effectiveness.

Based on the findings, school heads may continue supporting and sustaining the School-Based Intervention Program by

providing guidance, supervision, and resources to teachers. Teachers may further enhance literacy instruction by strengthening higher-order skills such as making inferences, critical reading, and extended writing while continuing the use of appropriate reading materials and vocabulary-building strategies. In numeracy, teachers may focus on improving learners' confidence in independent computation and their ability to interpret and analyze word problems through contextualized and learner-centered activities. Schools may also improve program implementation by ensuring sufficient instructional materials, regular monitoring and evaluation, and timely feedback. School administrators may provide uniform training, seminars, and professional development programs to strengthen the consistency and effectiveness of the intervention program across grade levels.

The study was limited to assessing the effectiveness of the School-Based Intervention Program based on teachers' perceptions of learners' literacy and numeracy skills development. Its findings were drawn from 50 teacher-respondents and focused on demographic profile, literacy and numeracy indicators, program implementation, strategies and materials, monitoring and evaluation, academic improvement, and differences in perceptions based on demographic variables. Therefore, the results reflect the views of the participating teachers and the specific context of the School-Based Intervention Program examined in the study.

Compliance with ethical standards

The study followed a systematic research process involving adviser review, instrument validation, permission-seeking, questionnaire administration, data retrieval, encoding, tabulation, and statistical analysis. The researcher used a validated survey questionnaire and personally administered it to selected teacher-respondents after permission was granted.

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