ISSN: 3116-3475
International Journal
of Education, Research, and Innovation Perspectives
Volume 2 Issue 11 (November 2026)

The Effect of Context-Based SIMs on the Mathematics Achievement of Grade 8 Students

Arnold A. Belarmino[1*], Ma. Teresa F. Mandi[2]
[1]*Bacoor National High School–Molino Main, Bacoor City, Cavite, Philippines;*
[2]*Technological University of the Philippines–Manila, Philippines*
[*]*arnold.belarmino2087@gmail.com*

Date Submitted:
September 12, 2026

Date Accepted:
October 09, 2026

Date Published:
November 17, 2026

DOI:
10.5281/zenodo.24317384

ABSTRACT

Remedial instruction that targets least mastered skills is a common response to low mathematics achievement in Philippine schools, yet intervention materials seldom draw on the learners' own locality. This study determined the effect of Context-Based Strategic Intervention Materials (CB-SIMs) on the mathematics achievement of Grade 8 students with least mastered skills in the third-quarter competencies of Mathematics 8. A one-group pretest–posttest pre-experimental design was employed. A 50-item Mathematics Diagnostic Test (MDT) administered to 89 students identified the least mastered skills, and 25 students of Bacoor National High School–Molino Main, Bacoor City, Cavite, whose z-scores were below −1 and who were categorized as High Difficulty Learners, underwent nine sessions of remedial instruction in School Year 2018–2019 using five CB-SIMs built around the history, culture, places, and events of Bacoor. Achievement was measured with a validated 35-item Mathematics Achievement Test (MAT; Cronbach's $\alpha = 0.71$), and students' experiences were gathered through a 10-item Learners' Experience Survey Form. Data were analyzed using mean percentage scores, mean and standard deviation, the paired t-test, and frequency and percentage. The MDT identified eight least mastered skills, four in Algebra and four in Geometry. The students' mean score in the MAT increased from 12.28 (SD = 4.09) in the pretest to 19.24 (SD = 6.50) in the posttest, a mean difference of 6.96 that was statistically significant, $t(24) = 5.101$, $p < .001$, and the least mastered skills were reduced from eight to three. Most students agreed or completely agreed that the CB-SIMs helped them understand the topics and increased their interest, particularly through the familiar local context. The study concludes that CB-SIMs are suitable learning materials for improving students' mathematics achievement during remedial instruction and recommends their regular use and the training of teachers in developing context-based intervention materials.

Keywords: *Strategic Intervention Materials, Context-Based Learning, Least Mastered Skills, Remedial Instruction, Mathematics Achievement, Grade 8 Mathematics*

INTRODUCTION

Mathematics is a challenging subject for many students, yet its basic skills, such as counting, measuring, telling time, and reasoning logically, are needed in daily life, in further education, and in employment. The mathematics performance of Filipino students, however, remains low. In the 2018 Programme for International Student Assessment (PISA), the Philippines obtained a mean score of 353 in mathematics, the second lowest among participating countries and economies and below the Level 2 baseline of proficiency of about 420 points (Organisation for Economic Co-operation and Development [OECD], 2019). At the school level, the Grade 10

ISSN: 3116-3475
International Journal
of Education, Research, and Innovation Perspectives
Volume 2 Issue 11 (November 2026)

students of Bacoor National High School–Molino Main obtained a mean percentage score (MPS) of 34.80 in mathematics in the 2015 National Achievement Test, far below the target MPS of 75.

Several factors have been associated with this low achievement, including students' shifting attention toward gadgets and entertainment and, as the researcher observed, the spiral progression of the K to 12 curriculum, which revisits topics across grade levels but may reduce the time available for mastering a particular topic. To address these gaps, schools in the Division of Bacoor are required to identify and report the least mastered skills based on the periodical examination every quarter and to develop teaching strategies that address these competencies. Remedial instruction, supported by appropriate instructional materials, is an important means of addressing such gaps, as instructional materials engage learners' senses and help them acquire concepts more easily (Olumorin et al., 2010; Iji et al., 2014).

One of the key features of the K to 12 mathematics curriculum is the delivery of lessons through localization and contextualization, a principle embedded in the Department of Education's (DepEd) mission to provide quality, equitable, culture-based, and complete basic education (Department of Education, 2013) and in the 1987 Philippine Constitution, which mandates the preservation and enrichment of Filipino national culture and the consideration of regional and sectoral needs in educational policies and programs (Constitution of the Republic of the Philippines, 1987, Art. XIV, Secs. 5 and 14). Students are more likely to understand lessons when the content is grounded in places, events, and terms familiar to them.

Strategic Intervention Materials (SIMs) are designed to re-teach least learned competencies to students who are working below expectations but can meet the standards if given timely support (Salviejo et al., 2014). SIMs have been found effective in improving students' performance in mathematics (Dumigsi & Cabrella, 2019) and science (Salviejo et al., 2014), and context-based instruction has been found to improve learners' problem-solving performance and mathematical connection ability (Dhlamini, 2012; Selvianiresa & Prabawanto, 2017). Brown and Redmond (2017) argued that understanding context in mathematics must encompass the social contexts in which students do mathematics and the pedagogy that enables them to participate in those contexts. However, existing SIMs have seldom been built around the learners' own locality, and the effect of combining the SIM format with a context-based approach on students' mathematics achievement has not been examined.

This study therefore determined the effect of Context-Based Strategic Intervention Materials (CB-SIMs) on the achievement of Grade 8 students with least mastered skills in Mathematics 8. Specifically, it sought to answer the following questions: (1) What is the students' mathematics achievement before their exposure to CB-SIMs? (2) What is the students' mathematics achievement after their exposure to CB-SIMs? (3) Is there a significant difference in the students' mathematics achievement before and after their exposure to CB-SIMs? (4) What are the students' experiences in the use of CB-SIMs? The least mastered skills of the students were also identified as the basis for developing the CB-SIMs. The findings are expected to help students cope with their learning difficulties, guide mathematics teachers in handling students with least mastered skills, and inform school administrators in planning intervention programs and teacher training.

Literature Review

Remediation and Response to Intervention

Remedial instruction is designed for students whose performance is below the expected mastery level and who are unable to keep pace with the teaching–learning process in the regular classroom. It is based on careful diagnosis of learning difficulties, and its results are used to decide which skills must be re-taught. In the Philippines, remediation and enrichment form part of classroom assessment policy, which provides for the use of assessment results to identify learners who need additional support (Department of Education, 2015).

The Response to Intervention (RTI) model offers a systematic means of addressing learners' needs through tiers of increasingly intensive support. Tier 2 provides strategic, small-group instruction for students who fall below benchmark scores on universal screening, typically several times per week for about 30 minutes per session,

ISSN: 3116-3475
International Journal
of Education, Research, and Innovation Perspectives
Volume 2 Issue 11 (November 2026)

in addition to the core instruction that all students receive (Lembke et al., 2012). The present study adopted a Tier 2 approach because the diagnostic results showed below-average performance and the identified students required closer supervision in small groups.

Strategic Intervention Materials as Learning Support

A SIM is an instructional material meant to re-teach concepts and skills that are least learned by students who are working below expectations but have the potential to meet the standards if given timely support and motivation (Salviejo et al., 2014). Unlike a module, which covers the topics of an entire chapter for regular or distance instruction, a SIM focuses on the specific skills that students failed to master in the regular class. A SIM is typically composed of a title card, which presents the topic; a guide card, which previews the lesson and stimulates interest; an activity card, which provides exercises that develop the target skill; an assessment card, which measures learning; an enrichment card, which provides opportunities to apply the concept; and a reference card (Salviejo et al., 2014).

Studies have shown the effectiveness of SIMs in improving achievement. Dumigsi and Cabrella (2019) found that Grade 9 students remediated with a SIM on problems involving quadratic functions attained a satisfactory proficiency level and performed significantly better than those remediated with the Learner's Material. Salviejo et al. (2014) found that SIM-based instruction improved students' performance in chemistry and that surface and deep learners performed equally well when the SIM was used. Iji et al. (2014) likewise found that improvised instructional materials improved students' achievement in geometry.

Context-Based Approach in Mathematics

Context-based instruction seeks to make mathematics more relevant and interesting by embedding concepts in situations familiar to learners. Heckman and Weissglass (1994) argued that mathematics is learned better when taught with other subjects in a real-world context. Borasi (1986) defined context as the situation in which a problem is embedded and proposed that context provides problem solvers with information that may enable the solution of the problem, while Meyer et al. (2001) suggested that contexts can motivate students to invent their own strategies when problems include situations that students can easily imagine and that serve as a source of mathematical reasoning. Brown and Redmond (2017) further emphasized that context includes the social settings in which students do mathematics and the pedagogy that enables them to participate.

Empirical studies support the use of context. Dhlamini (2012) found that Grade 10 learners who received context-based problem-solving instruction performed significantly better in certain aspects of problem solving than those who received conventional instruction and rated the approach highly. Selvianiresa and Prabawanto (2017) reported that contextual teaching and learning succeeds when it involves collaborative interaction among students, a high level of activity, connection to real-world contexts, and integration with other content and skill areas. When learners are familiar with the events, language, and pictures used, they can more easily imagine the situations presented and are more motivated to solve the problems given.

Collaborative Learning

Collaborative learning refers to instructional strategies that promote student collaboration in small groups to optimize their own and each other's learning (Johnson & Johnson, 1999), or more broadly to situations in which two or more people learn or attempt to learn something together, particularly through joint problem solving (Dillenbourg, 1999). Successful small-group learning depends on positive interdependence, face-to-face interaction, individual and group accountability, interpersonal skills, and group processing (Johnson & Johnson, 1999). Collaboration can have powerful effects on student learning, particularly for low-achieving students, although its effects may be moderated by student characteristics, group composition, and task characteristics (Lai, 2011). In this study, collaborative learning was used during the remedial sessions, with the teacher acting as facilitator while students worked in pairs or small groups on the CB-SIM activities.

ISSN: 3116-3475
International Journal
of Education, Research, and Innovation Perspectives
Volume 2 Issue 11 (November 2026)

Research Paradigm

The studies reviewed show that SIMs and context-based approaches can improve students' performance and that least mastered skills provide the basis for designing intervention materials. Most of these studies used experimental or quasi-experimental designs and reported improved performance after the intervention; however, none combined the SIM format with a context-based approach grounded in the learners' own locality. Building on these studies, the present study examined the link between the use of CB-SIMs as the independent variable and students' mathematics achievement as the dependent variable, as shown in Figure 1. It was hypothesized that there is a significant difference between the students' pretest and posttest mean scores in the Mathematics Achievement Test.

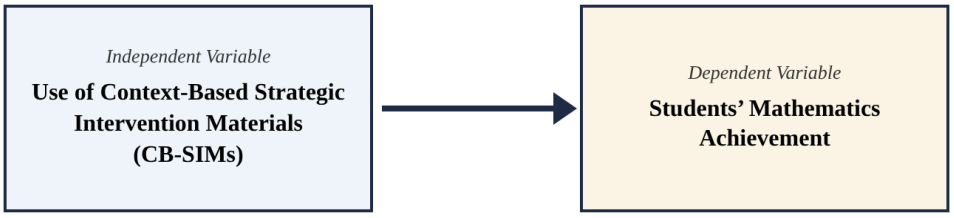


Figure 1. *Research Paradigm of the Study*

METHODS

Research Design

The study used a one-group pretest–posttest pre-experimental design (O1 X O2), where O1 is the pretest, X is the treatment using the CB-SIMs, and O2 is the posttest. A descriptive component identified the least mastered skills in Mathematics 8 for the third quarter, and the pre-experimental component determined students' achievement before and after exposure to the CB-SIMs. Quantitative analysis was used to determine the difference between the pretest and posttest means, while students' responses to the experience survey were analyzed to describe their experiences in using the CB-SIMs.

Research Locale

The study was conducted at Bacoor National High School–Molino Main in the Schools Division of Bacoor City, Cavite, during School Year 2018–2019. In that school year, the school had 36 regular Grade 8 sections and two Special Science Curriculum sections. The remedial sessions were held from February to March 2019, 50 minutes before the regular class, from 11:10 a.m. to 12:00 noon.

Participants and Sampling

The diagnostic test was administered to 89 students of Grade 8–Aqua and Grade 8–Flamingo, the two regular sections handled by the researcher. Students whose z-scores in the Mathematics Diagnostic Test were less than −1 were categorized as High Difficulty Learners (HDLs) and selected as participants. Because one of the two regular sections was homogeneous, the participants were 25 students from Grade 8–Flamingo.

Research Instrument

The Mathematics Diagnostic Test (MDT) was a researcher-made 50-item multiple-choice test covering 15 third-quarter learning competencies in Algebra and Geometry (relations and functions, if-then statements, inductive and deductive reasoning, and writing proofs) based on the budget of work for Mathematics 8. Its table of specifications followed the cognitive domains of the revised Bloom's taxonomy, excluding creating, which is

ISSN: 3116-3475
International Journal
of Education, Research, and Innovation Perspectives
Volume 2 Issue 11 (November 2026)

not suited to multiple-choice items, in accordance with DepEd Order No. 8, s. 2015 (Department of Education, 2015). The MDT was content-validated by two experts and revised accordingly.

The Mathematics Achievement Test (MAT) was initially a 50-item multiple-choice test based on the least mastered competencies and pilot-tested with Grade 8 Special Science Curriculum students. Item analysis retained items with a difficulty index of 0.21–0.80 and a discrimination index of 0.20 or above, discarded poor items, and revised fair items. The resulting 35-item test was content-validated by an expert, and its reliability estimate using Cronbach's alpha was 0.71, indicating acceptable internal consistency. The same MAT was used as the pretest and posttest.

Five CB-SIMs were developed based on the identified least mastered skills and were face- and content-validated by experts. The materials were aligned with the social content guidelines of DepEd's Learning Resources Management and Development System, such as showing Filipino festivals, celebrations, and customs and using illustrations of Philippine communities, places, and people. The CB-SIMs followed the adventures of a child named Bok and presented the history, culture, celebrations, food, and places of Bacoor. CB-SIM 1 covered relations and functions and dependent and independent variables; CB-SIM 2 covered linear functions and problems involving them, both set in the historical places, food, and products of Bacoor; CB-SIM 3 covered inductive and deductive reasoning, set in the observance of Holy Week and the San Nicolas carnival; and CB-SIMs 4 and 5 covered writing proofs and the types of proofs and mathematical systems, set around the Bacoor marching band. Each CB-SIM contained a title card, guide card, activity card, assessment card, enrichment card, reference card, and answer key. A 10-item Learners' Experience Survey Form (LESF), adapted from a previous study, was used to gather students' experiences on a five-point scale from 1 (completely disagree) to 5 (completely agree). An Expert's Evaluation Checklist and an Observer's Guide used by the Teacher-in-Charge and a colleague ensured that the materials were acceptable and that the SIM-based instruction was implemented as planned.

Data Gathering Procedure

The study involved five phases: (1) development and validation of the instruments; (2) administration of the MDT to identify the least mastered skills and the participants; (3) administration of the MAT pretest and the conduct of remedial instruction using the CB-SIMs, observed by the Teacher-in-Charge and a mathematics teacher; (4) administration of the MAT posttest; and (5) administration of the LESF a day after the posttest. Table 1 presents the activities in the nine remedial sessions.

Table 1. *Daily Activities in the Conduct of the Use of CB-SIMs*

Session	Duration	Learning Target/Activity	Material/Instrument
1	40 minutes	Orientation on remediation using CB-SIMs	Sample CB-SIMs, attendance sheet, parent consent
2	50 minutes	Administration of the pretest	35-item MAT
3	50 minutes	Verify if a given relation is a function; determine dependent and independent variables	CB-SIM 1: Relation and Function
4	50 minutes	Illustrate linear functions; solve problems involving linear functions	CB-SIM 2: Linear Function
5	50 minutes	Define and illustrate inductive and deductive reasoning; use them in an argument	CB-SIM 3: Inductive and Deductive Reasoning
6	50 minutes	Illustrate the need for an axiomatic structure of a mathematical system: defined and undefined terms, postulates, and theorems	CB-SIM 4: Writing Proofs
7	50 minutes	Write a proof (direct and indirect); describe a mathematical system	CB-SIM 5: Types of Proofs
8	50 minutes	Administration of the posttest	35-item MAT
9	40 minutes	Administration of the Learners' Experience Survey Form	LESF
Total	7 hours, 10 minutes		

ISSN: 3116-3475
International Journal
of Education, Research, and Innovation Perspectives
Volume 2 Issue 11 (November 2026)

During the CB-SIM sessions, the researcher acted as facilitator and guided the students in using the materials. The students worked in pairs or small groups, with each group sharing a material to promote collaborative learning, and were given 50 minutes to discuss and complete the activities. A reward was given to the first group that answered correctly to sustain interest.

Data Analysis

The least mastered skills were identified using the mean percentage score per item in the MDT; items answered correctly by fewer than 50% of the students were considered least mastered, and the percentages were interpreted as Mastered (96–100), Closely Approximating Mastery (86–95), Moving Towards Mastery (66–85), Average (50–65), Low (15–49), Very Low (5–14), and Absolutely No Mastery (0–4). Raw MDT scores were converted to z-scores to identify the HDLs. The highest and lowest scores, mean, and standard deviation described the pretest and posttest results, and the paired t-test, computed in IBM SPSS, determined whether the difference between the pretest and posttest means was significant at the 0.05 level. Frequency and percentage were used to summarize the LESF responses.

Ethical Consideration

Permission to conduct the study was secured from the Schools Division Superintendent of the Division of Bacoor City and the principal of Bacoor National High School–Molino Main. The students were oriented on the purpose and procedures of the remedial sessions, and parental consent was obtained through a parent consent form before the students participated. The remedial sessions were held outside regular class time so that the participants did not miss regular instruction.

RESULTS AND DISCUSSION

Least Mastered Skills in the Mathematics Diagnostic Test

Table 2 presents the least mastered skills identified from the MDT taken by 89 students. Of the 50 items, 19 (38%) obtained percentages of correct responses below 50%, all interpreted as Low, covering eight competencies: four in Algebra and four in Geometry. Item 34 (using inductive or deductive reasoning in an argument) obtained the lowest percentage of correct responses (22.47%). The total MPS was 52.81, with a mean score of 22.92 and a standard deviation of 7.60. Geometry, particularly writing proofs, accounted for the greater number of least mastered items, possibly because proving was a new concept to the students, while the low results on problems involving linear functions are consistent with the observation of Dumigsi and Cabrella (2019) that students can read mathematical concepts but find it difficult to comprehend problems.

Table 2. *Least Mastered Skills in the Mathematics Diagnostic Test*

Item Number	f	% Correct	Learning Competency
4, 5	30	33.71	Verifies if a given relation is a function.
6	34	38.20	Determines dependent and independent variables.
11, 12	28	31.46	Illustrates a linear function.
17 / 18 / 19	40 / 38 / 27	44.94 / 42.70 / 30.34	Solves problems involving linear functions.
33 / 34	30 / 20	33.71 / 22.47	Uses inductive or deductive reasoning in an argument.
37 / 39	44 / 37	49.44 / 41.57	Writes a proof (both direct and indirect).
40 / 41 / 42	33 / 32 / 42	37.08 / 35.96 / 47.19	Describes a mathematical system.
44 / 45 / 47 / 48	37 / 38 / 40 / 42	41.57 / 42.70 / 44.94 / 47.19	Illustrates the need for an axiomatic structure of a mathematical system: (a) defined terms; (b) undefined terms; (c) postulates; and (d) theorems.

Note. N = 89. All items were interpreted as Low (15–49). Items 4 and 5 and items 11 and 12 were reported jointly.

ISSN: 3116-3475
International Journal
of Education, Research, and Innovation Perspectives
Volume 2 Issue 11 (November 2026)

Students' Mathematics Achievement before and after Exposure to CB-SIMs

Table 3 presents the descriptive statistics of the students' pretest and posttest scores in the 35-item MAT. Before exposure to the CB-SIMs, the students obtained a mean score of 12.28 (SD = 4.09), with a highest score of 22 and a lowest score of 6. After exposure, the mean score rose to 19.24 (SD = 6.50), with a highest score of 28. The larger standard deviation in the posttest indicates that the posttest scores were more dispersed than the pretest scores, suggesting that the students did not benefit from the intervention to the same extent.

Table 3. *Descriptive Statistics of the Pretest and Posttest Scores in the Mathematics Achievement Test*

Test	Highest Score	Lowest Score	Mean	SD
Pretest	22	6	12.28	4.09
Posttest	28	7	19.24	6.50

Note. n = 25; maximum possible score = 35.

Table 4 presents the results of the paired t-test. The mean difference of 6.96 between the posttest and pretest scores was statistically significant, $t(24) = 5.101$, $p < .001$; thus, the hypothesis that there is a significant difference between the students' pretest and posttest mean scores was supported. The students' mathematics achievement after exposure to the CB-SIMs was significantly higher than before.

Table 4. *Paired t-Test Result in the Mathematics Achievement Test*

Test	Mean	Mean Difference	df	t-value	p-value	Remark
Posttest	19.24	6.96	24	5.101	< .001	Significant
Pretest	12.28					

Note. Two-tailed test at the 0.05 level of significance.

The significant improvement is consistent with studies showing that SIMs improve students' achievement when used for remediation (Salviejo et al., 2014; Dumigsi & Cabrella, 2019) and that context-based instruction improves learners' problem-solving performance (Dhlamini, 2012). The CB-SIMs combined the structured re-teaching of the SIM format with activities set in places, events, and terms familiar to the students, which, as Borasi (1986) and Meyer et al. (2001) suggested, can provide information and motivation that help students make sense of problems. The collaborative arrangement of the sessions may also have contributed, as collaboration can benefit low-achieving students in particular (Lai, 2011). Because the study used a single group without a control group, however, the improvement cannot be attributed to the CB-SIMs alone, as factors such as additional instructional time and familiarity with the test may also have contributed.

Least Mastered Skills after Exposure to CB-SIMs

Table 5 presents the items in the MAT posttest that remained least mastered after the students' exposure to the CB-SIMs. The least mastered skills were reduced from eight to three: two in Algebra (determining dependent and independent variables and illustrating a linear function) and one in Geometry (illustrating the need for an axiomatic structure of a mathematical system). Item 10, which required students to work with the graph of a linear function, had the lowest percentage of correct responses (24%). Students found identifying dependent and independent variables easy in isolation but difficult when the item was presented as a word problem, and they tended to think that functions could be represented only by equations. The geometry items on axiomatic structure remained difficult, as proving was a demanding topic given the limited time.

ISSN: 3116-3475
International Journal
of Education, Research, and Innovation Perspectives
Volume 2 Issue 11 (November 2026)

Table 5. *Least Mastered Skills in the Mathematics Achievement Test after Exposure to CB-SIMs*

Item Number	f	% Correct	Learning Competency
7	7	28	Determines dependent and independent variables.
8	8	32	Illustrates a linear function.
9	9	36	Illustrates a linear function.
10	6	24	Illustrates a linear function.
28	7	28	Illustrates the need for an axiomatic structure of a mathematical system: (a) defined terms; (b) undefined terms; (c) postulates; and (d) theorems.
29	8	32	Illustrates the need for an axiomatic structure of a mathematical system: (a) defined terms; (b) undefined terms; (c) postulates; and (d) theorems.

Note. n = 25. All items were interpreted as Low (15–49).

Students' Experiences in the Use of CB-SIMs

Table 6 presents the students' responses to the LESF. Most students agreed or completely agreed with all ten statements. The highest proportion of complete agreement was obtained by item 7 (72%), which stated that the adventure of Bok made the students realize the beautiful places and history of Bacoor, followed by item 9 (68%), on realizing that mathematics topics are exciting. Sixty-four percent completely agreed that the CB-SIMs helped them understand the third-quarter topics easily (item 1) and that the words and terms used suited their reading comprehension (item 4). Item 8, on the sufficiency of the time allotted, received comparatively lower complete agreement (48%), and item 10, on integrating CB-SIMs in other subjects, received 56%, with a few students disagreeing with these two statements.

Table 6. *Students' Experiences in the Use of CB-SIMs*

Statement	1	2	3	4	5
1. The CB-SIMs helped me to understand the topics in the third quarter easily.			3 (12%)	6 (24%)	16 (64%)
2. The flow of the activities and tasks was challenging yet easy to understand.			1 (4%)	9 (36%)	15 (60%)
3. The familiarity of the places, events, food, and history boosted my interest to read the content of the CB-SIMs.			3 (12%)	9 (36%)	13 (52%)
4. The words and terms used in the CB-SIMs are suited to my reading comprehension.			5 (20%)	4 (16%)	16 (64%)
5. The explanations provided in the CB-SIMs are complete and easy to understand.				5 (20%)	15 (60%)
6. The illustrations are colorful, and the text is readable.			1 (4%)	9 (36%)	15 (60%)
7. The adventure of Bok adds spice to the CB-SIMs since he made me realize the beautiful places and amazing history of Bacoor.			2 (8%)	5 (20%)	18 (72%)
8. The time allotted for the lesson using the CB-SIMs is sufficient.	1 (4%)		4 (16%)	8 (32%)	12 (48%)
9. The CB-SIMs made me realize that topics in mathematics are very exciting.		1 (4%)	2 (8%)	5 (20%)	17 (68%)
10. I am looking forward to these CB-SIMs being integrated in other subjects.	2 (8%)		3 (12%)	6 (24%)	14 (56%)

Note. n = 25. 1 = Completely Disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; 5 = Completely Agree. Values are frequencies with percentages in parentheses, as reported.

ISSN: 3116-3475
International Journal
of Education, Research, and Innovation Perspectives
Volume 2 Issue 11 (November 2026)

The responses indicate that the students had positive experiences with the CB-SIMs and that the local context was the feature they valued most. Their familiarity with the places, events, food, and history of Bacoor appeared to sustain their interest in reading and answering the materials, which supports the view that context can motivate learners and give meaning to mathematical tasks (Heckman & Weissglass, 1994; Meyer et al., 2001; Brown & Redmond, 2017). The colorful illustrations and readable text also helped the students understand the activities. The comparatively lower agreement on the sufficiency of time suggests that some students needed more time to complete the activities, particularly for the more demanding Geometry topics, which is consistent with the persistence of the axiomatic-structure competency as a least mastered skill after the intervention.

CONCLUSION

The use of Context-Based Strategic Intervention Materials significantly improved the mathematics achievement of Grade 8 students with least mastered skills, as shown by the significant difference between their pretest and posttest scores in the Mathematics Achievement Test. The least mastered skills were reduced from eight to three, although competencies involving the graph of a linear function, dependent and independent variables in word problems, and the axiomatic structure of a mathematical system remained difficult for the students. The students had positive experiences with the CB-SIMs and valued in particular the familiar local context of the materials. CB-SIMs are therefore suitable learning materials for improving students' mathematics achievement during remedial instruction.

Recommendation

Mathematics teachers may use CB-SIMs as instructional materials during remedial instruction to improve students' achievement, especially in Algebra and Geometry, and may allot more time for the more demanding topics, such as writing proofs and the axiomatic structure of mathematical systems. School administrators may conduct remedial classes on a regular basis to address the needs of students who have difficulties in mathematics. The Division Office and school administrators may provide teachers with opportunities to attend seminars or workshops on developing context-based SIMs in mathematics and other subjects. Future researchers may conduct similar studies on improving the achievement of students with least mastered skills, preferably using a control group and larger samples, to strengthen the evidence on the effectiveness of CB-SIMs.

References

Borasi, R. (1986). On the nature of problems. *Educational Studies in Mathematics, 17*(2), 125–141. https://doi.org/10.1007/BF00311517

Brown, R., & Redmond, T. (2017). Privileging a contextual approach to teaching mathematics: A secondary teacher's perspective. In A. Downton, S. Livy, & J. Hall (Eds.), *40 years on: We are still learning! Proceedings of the 40th Annual Conference of the Mathematics Education Research Group of Australasia*. MERGA.

Constitution of the Republic of the Philippines. (1987). Official Gazette of the Republic of the Philippines.

Department of Education. (2013). *DepEd Order No. 36, s. 2013: Our department's vision, mission and core values*. Department of Education.

Department of Education. (2015). *DepEd Order No. 8, s. 2015: Policy guidelines on classroom assessment for the K to 12 Basic Education Program*. Department of Education.

Dhlamini, J. J. (2012). *Investigating the effect of implementing a context-based problem-solving instruction on learners' performance* [Doctoral dissertation, University of South Africa]. UNISA Institutional Repository. https://uir.unisa.ac.za/handle/10500/9739

Dillenbourg, P. (1999). What do you mean by collaborative learning? In P. Dillenbourg (Ed.), *Collaborative-learning: Cognitive and computational approaches* (pp. 1–19). Elsevier.

Dumigsi, M. P., & Cabrella, J. B. B. (2019). Effectiveness of strategic intervention material in mathematics as remediation for grade 9 students in solving problems involving quadratic functions. *Asian Journal of Education and Social Studies, 5*(1), 1–10. https://doi.org/10.9734/ajess/2019/v5i130137

Heckman, P. E., & Weissglass, J. (1994). Contextualized mathematics instruction: Moving beyond recent proposals. *For the Learning of Mathematics, 14*(1), 29–33.

Iji, C. O., Ogbole, P. O., & Uka, N. K. (2014). Effect of improvised instructional materials on students' achievement in geometry at the upper basic education level in Makurdi Metropolis, Benue State, Nigeria. *American Journal of Educational Research, 2*(7), 538–542. https://doi.org/10.12691/education-2-7-17

Johnson, D. W., & Johnson, R. T. (1999). *Learning together and alone: Cooperative, competitive, and individualistic learning* (5th ed.). Allyn and Bacon.

Lai, E. R. (2011). *Collaboration: A literature review*. Pearson.

Lembke, E. S., Hampton, D., & Beyers, S. J. (2012). Response to intervention in mathematics: Critical elements. *Psychology in the Schools, 49*(3), 257–272. https://doi.org/10.1002/pits.21596

Meyer, M. R., Dekker, T., & Querelle, N. (2001). Context in mathematics curricula. *Mathematics Teaching in the Middle School, 6*(9), 522–527.

Olumorin, C. O., Yusuf, A., Ajidagba, U. A., & Jekayinfa, A. A. (2010). Development of instructional materials from local resources for art-based courses. *Asian Journal of Information Technology, 9*(2), 107–110.

Organisation for Economic Co-operation and Development. (2019). *PISA 2018 results (Volume I): What students know and can do*. OECD Publishing. https://doi.org/10.1787/5f07c754-en

Salviejo, E. I., Aranes, F. Q., & Espinosa, A. A. (2014). Strategic intervention material-based instruction, learning approach and students' performance in chemistry. *International Journal of Learning, Teaching and Educational Research, 2*(1).

Selvianiresa, D., & Prabawanto, S. (2017). Contextual teaching and learning approach of mathematics in primary schools. *Journal of Physics: Conference Series, 895*, Article 012171. https://doi.org/10.1088/1742-6596/895/1/012171