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Learners' Proficiency in Solving Word-Problems in Mathematics: Basis for an Instructional Materials Development

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Abstract:

This research investigates the proficiency of learners in solving word problems in mathematics within a private school situated in a first-class component city in Southern Negros during the School Year 2022-2023, aiming to inform the development of instructional materials. Quantitative data were collected from 119 Senior High School respondents via a meticulously crafted questionnaire, which was subjected to validity and reliability. The questionnaire targeted three primary topics: functions and their graphs, basic business mathematics, and logic. Results indicate a predominance of female respondents and STEM learners, with a notable portion of parents possessing college or graduate-level education. Basic Business Mathematics emerged as the area with the lowest scores. Statistical analysis revealed significant differences in proficiency levels in this area based on sex and academic strand, while Functions and Their Graphs showed significant differences based solely on academic strand. In contrast, the Logic area showed no significant differences across any demographic variables. These findings were instrumental in guiding the development of instructional materials for General Mathematics, enhancing educational strategies tailored to address specific proficiency gaps identified among learners.

Keywords: Mathematics Proficiency, Word problems, Senior High School Learners, General Mathematics

Introduction:

Nature of the Problem

Mathematical proficiency is a crucial aspect of education that can impact a student's future. It involves a deep understanding of mathematical concepts, the ability to apply them in real-world situations, and the confidence to tackle complex problems. Mathematics is not just a subject that learners learn in school but a valuable tool that enables them to think logically, make informed decisions, and solve problems in their daily lives (Cresswell & Speelman, 2020). Whether pursuing higher education, entering the workforce, or simply navigating everyday life, learners proficient in mathematics have a competitive advantage. These skills apply to mathematical problems and various fields like science, engineering, economics, and finance.

There has been growing concern nationally and internationally about the falling appeal of mathematics among learners and the poor performance of learners in mathematics. Recent data showed that Filipino learners' poor mathematical performance had placed the country in the 77th rank out of 81 countries worldwide (PISA, 2023). The Enhanced Basic Education Act of 2013's implementation of the new K–12 Basic Education Program focuses on the study of mathematics. The Department of Education (DepEd) claims that the new curriculum gives learners a strong foundation and a better grasp of mathematics. Only two fields of mathematics are required as core subjects in the SHS: Statistics and Probability and General Mathematics (Legarde, 2023).

Despite the improvements brought by the K–12 curriculum, the researcher has observed that many Senior High School learners still struggle to solve mathematical word problems, especially in real-life contexts like functions, business math, and logic. While the curriculum aims to build a strong foundation, there is a lack of localized studies that explore this specific challenge at the school level.

The study endeavors to determine the learners' level of proficiency in solving word problems in mathematics, particularly in general mathematics, in the following topics: functions and their graphs, basic business mathematics, and logic, which serve as an empirical basis for instructional material development.

Objectives of the Study

This study aimed to determine the learners' level of proficiency in solving word problems in mathematics in a private school in a first-class component city in Southern Negros for the School Year 2022- 2023 as a basis for instructional material development. Specifically, it seeks answers to the following questions: 1) the learners' level of proficiency in solving word problems in mathematics according to functions and their graphs, basic business mathematics, and logic; 2) the learners' level of proficiency in solving word problems in mathematics when they are grouped according to the aforementioned variables; 3) the significant difference in the learners' level of proficiency in solving word problems in mathematics when grouped and compared according to the aforementioned variables.

Current State of Knowledge

Galman (2019) emphasized that improving mathematics education and developing learners' problem-solving proficiency require the integration of real-life scenarios, the breakdown of problems into smaller parts, and the encouragement of visualization strategies. These approaches are considered effective in enhancing students' mathematical thinking. Similarly, Xin et al. (2023) highlighted that while equations, formulas, and methods are essential elements in a mathematics classroom, the ability to solve problems remains the most critical skill students can acquire. Mathematical concepts become more meaningful when presented in tangible, real-world representations. As a result, there has been a significant shift in recent decades toward adopting a problem-solving approach in mathematics education.

Kenny and Ntow (2024) further noted that translating word problems into mathematical equations poses difficulties for many learners. This process requires the correct use of fundamental operations, accurate identification of given information, and recall of mathematical rules or formulas. They that problem-solving is a central aspect of the mathematics learning experience, and paying attention to effective strategies can help address students' struggles in solving word problems.

Concerns about students' poor performance in mathematics have also been raised internationally. The OECD (2019) reported a growing global concern about the declining interest in mathematics and the consistently low achievement of learners in this subject. Recent data revealed that Filipino learners ranked 76th out of 77 nations worldwide in mathematics performance. Similarly, the IEA (2020) confirmed that Filipino learners scored poorly in the Trends in International Mathematics and Science Study (TIMSS). In stark contrast, neighboring countries such as Singapore, South Korea, Hong Kong, Chinese Taipei, and Japan consistently ranked among the top performers globally. These findings highlight the urgency of addressing the gaps in mathematics education in the Philippines.

Adding to these insights, Unal et al. (2023) suggested that encouraging learners to create their own visual representations enhances both understanding and accuracy in solving problems. Mudaly et al. (2023) also observed that students who struggle with word problems often find it difficult to visualize the given scenarios. Similarly, Pongsakdi et al. (2019) argued that problem-solving is not limited to computational skills but also involves reading comprehension, strategic planning, and translating text into mathematical expressions. These perspectives point to the vital role of teachers in developing high-quality instructional materials that can strengthen learners' problem-solving skills in mathematics.

Theoretical Underpinnings

This study anchored on Five-strand model of mathematical proficiency by MacGregor (2013) stressed that proficient learners can monitor and regulate their thinking, use appropriate strategies for solving problems, and reflect on their understanding and learning, which can be considered a growth mindset toward mathematics. Developing mathematical proficiency among learners should emphasize the importance of learners' understanding of numbers and operations. It shows the importance of creating opportunities for learners to actively construct their knowledge, see the interconnectedness of mathematical concepts, and develop a strong foundation in numbers and operations (Altarawneh & Marei, 2021). Therefore, the Five Strands of Mathematical Proficiency, as described by MacGregor (2013), provides a practical and meaningful framework for understanding how Senior High School learners solve word problems in General Mathematics.

Methodology:

This section presents the discussion of the research methodology used, the subjects and respondents of the study, the research instruments used, the validity and reliability of the instruments, the procedure for data gathering, and the statistical tools and procedure for data analysis.

Research Design

This study employed the descriptive research design to determine the learners' proficiency level in solving math word problems. Descriptive research method provides a way to describe the nature of the situation as it exists at the time of the study. Descriptive design is appropriate for studies that aim to discover what prevails in the present conditions or relationships, held opinions and beliefs, processes and effects, and developing trends. Additionally, the design is a scientific methodology that entails watching and characterizing a subject's behavior without changing it. According to Siedlecki (2020), descriptive research involves the investigation of facts with a proper and accurate interpretation of the results, the descriptive research approach is outlined. It emphasizes what exists, such as current conditions, practices, situations, or phenomena. Descriptive research designs are also valuable to have an important knowledge about the present situation of the study. It can be yielded to enrich data that least to import a recommendation. The level of proficiency in solving word-problems in mathematics by Senior High School learners will be studied to find out prevailing condition that may address current needs and problems.

Study Respondents

The study involved 119 Grade 11 learners selected from a total population of 170 using Cochran's formula to determine the appropriate sample size, as it is suitable for large or infinite populations and applicable to proportions and means (Ahmed, 2024). A stratified random sampling technique was employed, dividing the population into homogeneous subgroups (strata) based on their academic strands—HUMSS, ABM, and STEM—and then randomly selecting respondents from each stratum using the lottery method (Garg, 2024). The number of respondents per strand was calculated by dividing the number of students in each strand by the total population and multiplying by the target sample size, resulting in 16 from HUMSS (13.40%), 19 from ABM (16.00%), and 84 from STEM (70.60%).

Instruments

The study used a self-made instrument to gather baseline-data. The instruments were divided into two parts: Part 1 contains queries on respondents' profile such as sex, parents' highest educational attainment, average family income, and academic strand. Part 2 is the questionnaire that consists of 45 items test included subjects in General Mathematics, such as functions and their graphs, basic business mathematics, and logic; in every area, there were 15 items for a total of 45. To make sure that the study runs smoothly, the following procedure was employed. There was a letter of request addressed to the Director of the School of Basic Education for the conduct of the study for approval. Upon securing the approval, a letter of parent's consent was sent to all target respondents. After the parent's approval, the questionnaires were administered to target respondents. The respondents are asked to answer the 45-item test. The research instrument was subjected to validity (4.04-very good) and reliability (0.943-excellent). All of them were interpreted as very good and excellent; respectively.

Data Gathering Procedure

After the instrument was found valid and reliable, the researcher observed the following processes in gathering the data needed for this study. First, the researcher sent a letter addressed to the Director of Basic Education Department for her approval to conduct this study. Second, the researcher sought the parental consent in letting their children to participate. After securing the parental consent, questionnaires were administered to target respondents. The data gathered from the responses of the respondents were tallied and tabulated using the appropriate statistical tools. The raw data were transformed into numerical code guided by a coding manual. This allowed computer processing, statistical derivations and tabular presentation. The Statistical Package for Social Sciences (SPSS) was used in the computer processing of the encoded data.

Data Analysis and Statistical Treatment

Objective No. 1 used the descriptive-analytical scheme and mean to determine the learners' level of proficiency in solving word problems in mathematics in the following topics: functions and their graphs, basic business mathematics, and logic.

Objective No. 2 used the descriptive-analytical scheme and mean to determine the learners' level of proficiency in solving word problems in mathematics when grouped according to the aforementioned variables.

Objective No. 3 used the comparative-analytical scheme and t-test to determine whether or not significant differences exist in the proficiency level of the SHS learners in solving word problems when grouped and compared according to the aforementioned variables.

Ethical Consideration

The protection of human participants through the application of ethical principles is a fundamental aspect of any

research study. The principle of voluntary participation emphasizes that individuals should not be forced or coerced into joining a study (Trochim, 2021). Regarding informed consent, participants were provided with complete information about the research procedures and potential risks, and parental consent was secured where necessary. They were fully briefed on all aspects of the study and invited to participate by signing a consent form. Furthermore, safeguards were implemented to minimize risks, particularly in studies involving vulnerable populations or sensitive topics (Peter, 2015). Concerning confidentiality, participants were assured that any identifying information would remain inaccessible to those not directly involved in the research. With respect to anonymity, stricter measures were observed to ensure that participants' identities remained undisclosed throughout the study.

Results and Discussion

This section deals with the presentation, analysis and interpretation of data gathered to carry out the objectives of this study. All these were made possible by following certain appropriate procedures so as to give the exact data and solution to each specific problem.

Table 1
Learners' Level of Proficiency in Solving Word Problems in Mathematics

Topics		Mean	Interpretation
1.	Functions and their Graphs	12.04	High Level
2.	Basic Business Mathematics	10.03	High Level
3.	Logic	12.17	High Level

Table 1 shows the learners' proficiency in solving word problems in mathematics in the following topics: functions and their graphs, basic business mathematics, and logic. The results have shown that logic obtained the highest mean score of 12.17 among the three topics, interpreted as "high level." At the same time, basic business mathematics had the lowest mean of 10.03, which is interpreted as a "high level." According to the result, learners generally possess strong problem-solving skills in mathematics; however, they appear to experience relatively more difficulty with basic business mathematics because this is more attributed to the formula-based nature of this topic. The results affirmed the work of Koskinin and Pitkäniemi (2022). They emphasize the importance of instructional strategies that foster meaningful connections between mathematical concepts and promote more robust learning outcomes than those relying primarily on memorization.

Table 2
Learners' Level of Proficiency in Solving Word Problems in Mathematics When Grouped According to Sex

Topics		Male		Female	
		Mean	Interpretation	Mean	Interpretation
1.	Functions and their Graphs	12.04	High Level	12.04	High Level
2.	Basic Business Mathematics	11.34	High Level	9.26	High Level
3.	Logic	12.52	High Level	11.97	High Level

Table 2 shows the learners' level of proficiency in solving word problems in mathematics when grouped according to sex. It is revealed that male respondents have higher mean scores than females in three specific areas: function and their graphs, basic business mathematics, and logic. The mean scores for males in these areas are 12.04, 11.34, and 12.52, respectively, while the corresponding mean scores for females are 12.04, 9.26, and 11.97, respectively. Additionally, among the three topics, lower mean scores were evident in both sexes under basic business mathematics. The result implies that learners, regardless of their sex, have struggled when solving business-related problems when it is converted into a real-life context. Their understanding tends to be more about memorizing steps than truly grasping the concepts, which makes it harder for them to use what they've learned when solving real-world problems. Using word problems regularly, encouraging learners to work together, and offering step-by-step support can help make abstract formulas feel more practical and relatable. These strategies make it easier for learners to connect what they learn in class to real-life situations. The results affirm the findings of Meintjes (2015), as cited by Gcabashe (2024). The concept of proficiency in mathematics is particularly relevant to the findings of our study, which indicate that learners, regardless of their sex, have struggled when solving business-related problems when it is converted into a real-life context. This seems to happen because they're mostly taught through drills and formula-based exercises, with little emphasis on applying those skills in everyday situations.

Table 3
Learners' Level of Proficiency in Solving Word Problems in Mathematics When Grouped According to Parent's Highest Educational Attainment

Topics		Lower		Higher	
		Mean	Interpretation	Mean	Interpretation
1.	Functions and their Graphs	11.84	High Level	12.19	High Level

2.	Basic Business Mathematics	9.74	Moderate Level	10.25	High Level
3.	Logic	11.96	High Level	12.33	High Level

Table 3 shows the learners' proficiency in solving word problems in mathematics when grouped according to parent's highest educational attainment. The results revealed that basic business mathematics received the lowest mean scores from both groups among the three topics. The lower group garnered a mean score of 9.74, interpreted as a "moderate level," while the higher group scored slightly better with a mean of 10.25, interpreted as a "high level." The result implies that learners face challenges in solving business mathematics problems, regardless of their parents' educational attainment. This indicates that difficulties with the subject are common across different backgrounds and not necessarily influenced by parental educational attainment. This is supported by the fact that many of my SHS learners struggle to solve word business-related problems because they do not know what formula they are going to use to solve the problem. They memorize the formula and know how to use it when the problem is not in a word problem given. However, when it is converted into a real-life scenario, they have difficulty identifying what formula to use. The results affirmed the work of Mamolo (2019). It underscores the challenges learners face in effectively answering problems in General Mathematics. The learner's lack of skills in solving business-related problems was evident. This aligns with the difficulties observed in the classroom, where the practice and application of the lessons were often limited to formula-based problems rather than practical, real-life situations.

Table 4
Learners' Level of Proficiency in Solving Word Problems in Mathematics When Grouped According to Average Family Monthly Income

Topics		Lower Mean	Interpretation	Higher Mean	Interpretation
1.	Functions and their Graphs	11.74	High Level	12.33	High Level
2.	Basic Business Mathematics	10.20	High Level	9.86	Moderate Level
3.	Logic	12.42	High Level	11.93	High Level

Table 4 shows learners' proficiency in solving word problems in mathematics according to average family monthly income. The mean scores for functions and their graphs were 11.74 and 12.33 for the lower and higher groups, respectively, both interpreted as "high level." Looking at the results, it's interesting to see that both income groups performed at a high level in Functions and their Graphs and Logic. The lower-income group had a mean of 11.74 and 12.42, respectively, while the higher-income group recorded 12.33 and 11.93. This suggests that regardless of financial background, learners generally find these two topics manageable. From experience, many learners enjoy working with graphs and logical reasoning; it's visual and structured and often less intimidating than wordy math problems. However, Basic Business Mathematics stands out. Here, the lower-income group scored an average of 10.20, interpreted as "high level," while the higher-income group scored an average of 9.86, interpreted as "moderate level." This might seem surprising at first; we often assume that learners from more financially stable families might have an edge, perhaps due to access to more resources. The results affirmed the work of Boaler et al. (2016), who pointed out that learners were more successful in math when it is taught in a way that connects to their real lives, not just through memorized rules and procedures.

Table 5
Learners' Level of Proficiency on Solving Word Problems in Mathematics When Grouped According to Academic Strand

Topics		ABM Mean	Interpretation	HUMSS Mean	Interpretation	STEM Mean	Interpretation
1.	Functions and their Graphs	12.47	High Level	10.56	High Level	12.22	High Level
2.	Basic Business Mathematics	5.94	Low Level	7.56	Moderate Level	11.42	High Level
3.	Logic	10.57	High Level	12.50	High Level	12.47	High Level

Table 5 shows learners' proficiency level in solving word problems in mathematics according to academic strand. Looking at the results, all ABM, HUMSS, and STEM strands performed at a high level, but when we examine each topic more closely, some key differences stand out. Most noticeably, Basic Business Mathematics was the lowest-performing area, especially for ABM learners, who scored an average of 5.94, interpreted as "low level." This result was quite surprising at first. Since ABM learners are focused on business and finance, we expect them to perform better in this topic. The result implies that for ABM learners, there was a need to bridge the gap between knowing and applying math. Many ABM learners can memorize business formulas and apply them in simple exercises, but they often feel lost once those problems are turned into real-world word problems. They struggle not with the computation but with understanding the situation and figuring out which formula fits. They need more practice in reading, analyzing, and connecting math to realistic situations, which is something the teachers can help with by using relatable and engaging examples. The findings also align with the study of Abendanio et al. (2019), which

revealed that ABM learners commonly face challenges in Business Mathematics subjects such as Accounting and Business Finance. According to them, many ABM learners report low confidence in their problem-solving skills, which further affects their willingness to engage with complex or unfamiliar mathematical tasks. This lack of confidence can create a cycle where learners avoid challenging problems, leading to missed opportunities for growth and mastery.

Table 6
Comparative Analysis on the Learners' Level of Proficiency in Solving Word Problems in Mathematics in the Topic Functions and Their Graphs When Grouped and Compared According to the Aforementioned Variables

Variable	Category	N	Mean	t	F	p-value	*Sig. level*	Interpretation
Sex	Male	44	12.04	.014		0.989	0.05	Not Significant
	Female	75	12.04					
Parents' Highest Educational Attainment	Lower	51	11.84	-.897		0.372		Not Significant
	Higher	68	12.19					
Average Family Monthly Income	Lower	59	11.74	-1.540		0.126		Not Significant
	Higher	60	12.33					
Academic Strand	ABM	19	12.47		5.053	0.008		Significant
	HUMSS	16	10.56					
	STEM	84	12.22					

Table 6 shows the comparative analysis on the learners' level of proficiency in solving word problems in mathematics in the topic functions and their graphs when grouped and compared according to the aforementioned variables. When grouped according to sex, both male and female obtained a mean score of 12.04, the computed p value was 0.989 interpreted as "not significant" which signifies that there is no significant difference. Therefore, the hypothesis of the study was rejected. When grouped according to parents' highest educational attainment, lower group obtained a mean score of 11.84 and the higher group obtained a mean score of 12.19, the computed p value of 0.372 interpreted as "not significant" which signifies that there is no significant difference. Therefore, the hypothesis of the study was rejected. When grouped according to average family monthly income, lower group obtained a mean score of 11.74 and the higher group obtained a mean score of 12.33, with the p value of 0.126 interpreted as "not significant". Therefore, the hypothesis of the study was rejected. When grouped according to academic strand, ABM obtained a mean score of 12.47, HUMSS obtained a mean score of 10.56, and STEM obtained a mean score of 12.22, with the p value of 0.008 interpreted as "significant". Therefore, the hypothesis of the study was accepted. The study by Baucas (2024) highlights a potential implication that the HUMSS strand had lower arithmetic skills when selecting their senior high school track. In contrast, learners with stronger math abilities opted for STEM or ABM.

Table 7
Comparative Analysis on the Learners' Level of Proficiency in Solving Word Problems in Mathematics in the Topic Basic Business Mathematics When Grouped and Compared According to the Aforementioned Variables

Variable	Category	N	Mean	t	F	p-value	*Sig. level*	Interpretation
Sex	Male	44	11.34	2.896		0.005	0.05	Significant
	Female	75	9.26					
Parents' Highest Educational Level	Lower	51	9.74	-.700		0.486		Not Significant
	Higher	68	10.25					
Average Family	Lower	59	10.20	.471		0.639		Not Significant

Monthly Income							
	Higher	60	9.86				
	ABM	19	5.94				
Academic Strand	HUMSS	16	7.56	27.830	0.000		Significant
	STEM	84	11.42				

Table 7 shows the comparative analysis on the learners' level of proficiency in solving word problems in mathematics in the topic basic business mathematics when grouped and compared according to the aforementioned variables. When grouped according to sex, male obtained a mean score of 11.34, and female obtained a mean score of 9.26, the computed p value was 0.005 interpreted as "significant" which signifies that there is a significant difference. Therefore, the hypothesis of the study was accepted. When grouped according to parents' highest educational attainment, lower group obtained a mean score of 9.74 and the higher group obtained a mean score of 10.25, the computed p value of 0.486 interpreted as "not significant" which signifies that there is no significant difference. Therefore, the hypothesis of the study was rejected. When grouped according to average family monthly income, lower group obtained a mean score of 10.20 and the higher group obtained a mean score of 9.86, with the p value of 0.639 interpreted as "not significant". Therefore, the hypothesis of the study was rejected. When grouped according to academic strand, ABM obtained a mean score of 5.94, HUMSS obtained a mean score of 7.56, and STEM obtained a mean score of 11.42, with the p value of 0.000 interpreted as "significant". Therefore, the hypothesis of the study was accepted. The study of Hiğde & Aktamış (2022) explored the effects of STEM academic training on learners' mathematical proficiency, noting that non-STEM learners may face challenges in solving mathematics problems.

Table 8
Comparative Analysis on the Learners' Level of Proficiency in Solving Word Problems in Mathematics in the Topic Logic When Grouped and Compared According to the Aforementioned Variables

Variable	Category	N	Mean	t	F	p-value	*Sig. level*	Interpretation
Sex	Male	44	12.52	.898		0.371		Not Significant
	Female	75	11.97					
Parents' Highest Educational Level	Lower	51	11.96	-.631		0.529		Not Significant
	Higher	68	12.33					
Average Family Monthly Income	Lower	59	12.42	.830		0.408	0.05	Not Significant
	Higher	60	11.93					
Academic Strand	ABM	19	10.57		2.872	0.061		Not Significant
	HUMSS	16	12.50					
	STEM	84	12.47					

Table 8 shows the comparative analysis on the learners' level of proficiency in solving word problems in mathematics in the topic logic when grouped and compared according to the aforementioned variables. When grouped according to sex, male obtained a mean score of 12.52, and female obtained a mean score of 11.97, the computed p value was 0.371 interpreted as "not significant" which signifies that there is no significant difference. Therefore, the hypothesis of the study was rejected. When grouped according to parents' highest educational attainment, lower group obtained a mean score of 11.96 and the higher group obtained a mean score of 12.33, the computed p value of 0.529 interpreted as "not significant" which signifies that there is no significant difference. Therefore, the hypothesis of the study was rejected. When grouped according to average family monthly income, lower group obtained a mean score of 12.42 and the higher group obtained a mean score of 11.93, with the p value of 0.408 interpreted as "not significant". Therefore, the hypothesis of the study was rejected. When grouped according to academic strand, ABM obtained a mean score of 10.57, HUMSS obtained a mean score of 12.50, and STEM obtained a mean score of 12.47, with the p value of 0.061 interpreted as "not significant". Therefore, the hypothesis of the study was rejected. As supported by Stoet and Geary (2020), the learners' ability to solve logic-based word problems in General Mathematics doesn't seem to depend on their sex, their parents' level of education,

how much their family earns, or which academic strand they belong to. Even learners from different strands, whether STEM, HUMSS, or ABM, tend to perform similarly in logic, as long as they're given the same learning opportunities. All of this supports the idea that logic is a skill learners can build regardless of their background.

Conclusions:

In conclusion, Among the three topics, Basic Business Mathematics emerged as the most challenging, with a noticeably lower level of proficiency across the student population. This difficulty may stem from the practical and technical nature of the subject, which includes concepts like interest computation, financial transactions, and percentage applications, topics that students often find abstract or unfamiliar without a real-world context.
Notably, significant differences in proficiency in Basic Business Mathematics were observed when learners were grouped by sex and academic strand, implying that females and non-STEM strand learners may face more pronounced challenges in this area. In contrast, in the topic of Functions and Their Graphs, only the academic strand emerged as a significant factor, indicating that the way students are prepared within their respective strands can impact their understanding of this topic. Interestingly, for the topic of Logic, no significant differences were found across any of the demographic variables.

Recommendations

Based on the findings and conclusions of this investigation about the learners' proficiency in solving word problems in mathematics as a basis for an instructional material development, the following recommendations are hereby proposed:

1. **Create Contextualized Instructional Materials for Basic Business Mathematics**: Develop instructional materials that integrate real-life financial scenarios to simplify concepts like interest, transactions, and percentages. Using relatable examples and hands-on activities helps students connect math to practical situations, boosting engagement, confidence, and performance.

2. **Implement Differentiated Teaching Strategies Based on Academic Strand**: Adopt flexible teaching methods tailored to students' academic strands. Non-STEM learners may need scaffolded tasks, visual aids, and frequent assessments. Differentiated instruction ensures inclusivity, supports varied learning needs, and fosters better understanding and attitudes toward math.

3. **Offer Focused Support Programs for Female and Non-STEM Learners**: Provide targeted support such as peer tutoring, remedial sessions, and confidence-building workshops. Address math anxiety by creating safe, supportive spaces and encouraging mentoring and role models. This approach builds both competence and confidence in struggling learners.

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