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# BUSINESS MATHEMATICS LEAST-MASTERED COMPETENCIES IN SENIOR HIGH SCHOOL: BASIS FOR CRAFTING CONTEXTUALIZED LEARNING MATERIALS

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## ABSTRACT

This study addressed consistently low summative assessment scores in Business Mathematics at Solano High School by identifying the Least-Mastered Competencies (LMCs) among Grade 11 ABM learners. The primary objective was to establish a data-driven basis for crafting Contextualized Learning Materials (CLMs). It also investigated the relationship between the LMCs and the learners' demographic profile. A descriptive-correlational research design was employed, utilizing the total population of 92 students. Data were collected via a demographic survey and a validated 60-item multiple-choice test (third-quarter examination). The study found that learners achieved an overall 58% Average Mastery level, falling significantly below the expected 75% standard. Ten LMCs were identified, spanning fundamental operations (fractions, decimals, percent) and core applied business concepts. The low mastery level indicates an urgent need for subject-specific intervention to bridge the gap in both foundational skills and application proficiency.

***Keywords:*** *Business Mathematics, Least-Mastered Competencies, Contextualized Learning Materials, Mastery Level, ABM Learners.*

## INTRODUCTION

Business Mathematics is a specialized subject crucial for Grade 11 ABM students, but consistently low summative assessment scores at Solano High School indicate a significant learning problem. This challenge aligns with general findings that students struggle with mathematics due to conceptual complexity and rapid forgetting.

Analysis of previous years' assessment data (S.Y. 2019-2020 and 2022-2023) confirmed specific, persistent least-mastered competencies (LMCs). The most critical LMCs are illustrating how interest is computed (mortgage, amortization, etc.). and differentiating and illustrating Mark-on, Mark-down, and Mark-up.

To address these LMCs, the study proposed developing contextualized learning materials (CLMs), which connect mathematical concepts to real-world scenarios, a strategy supported by literature to enhance mastery and performance.

The primary objective was to determine the least-mastered competencies in Business Mathematics during the third quarter (S.Y. 2023–2024) to serve as a basis for crafting and prioritizing these contextualized learning materials for Grade 11 ABM learners.

The study specifically investigated the LMCs, their relationship with the learners' demographic profile (sex, income, math grade, JHS program), and the criteria for developing the CLMs. The null hypothesis stated that there was no significant relationship between the learners' demographic profile and the least-mastered competencies.

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## METHODS

A descriptive-correlational research design was employed. The study used descriptive methods to profile the respondents and identify their least-mastered competencies (LMCs) in Business Mathematics. A correlational approach was used to determine the significant relationship between the respondents' demographic profiles and the LMCs. The study was conducted at Solano High School. The respondents comprised the total population of 92 Grade 11 ABM learners (from Ivory and Turquoise sections) enrolled during the 2nd semester of S.Y. 2023-2024. A survey questionnaire was used for the demographic profile (sex, income, Math 10 grade, JHS program). A 60-item Multiple-Choice Test (36 LOTS, 24 HOTS), based on a Table of Specifications (TOS) derived from the third-quarter curriculum, served as the primary assessment tool. The test and TOS were rigorously validated. The survey and the test (administered as the third-quarter examination) were given concurrently for one hour. LMCs were identified based on the DepEd Mastery Level Classification, specifically targeting competencies that resulted in an average mastery level or below following item analysis. The study ensured the confidentiality and anonymity of all respondents' information, using the data solely for research purposes. Informed consent was implemented via a consent letter addressed to the parents or guardians, emphasizing the voluntary nature of participation and the right to withdraw or reject participation without consequences. The collected data were analyzed using frequency and percentage o describe the respondents' profile (sex, monthly household income, Grade in Mathematics 10, and completed JHS Program), frequency count, percent, mean, variance, and standard deviation to determine and rank the least-mastered competencies (mastery level) in Business Mathematics and Pearson r to determine the significant relationship between the respondents' demographic profile and their performance on the least-mastered competencies.

## RESULTS AND DISCUSSION

*Table 1*

*Frequency and Percentage Distribution of Learners According to Sex*

| Sex | No. of Learners | % |
|---|---|---|
| Male | 28 | 30.43 |
| Female | 64 | 69.57 |
| **Total** | **92** | **100** |

Table 1 presents the frequency and percentage distribution of learners according to sex. It can be observed that respondents are predominantly females because ABM strand have more female enrollees than males. This data aligns with findings from Alcobendas (2022), which also observed a higher number of female learners in the ABM strand among senior high school learners.

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Table 2

*Frequency and Percentage of Learners According to Monthly Household Income*

| **Monthly Household Income** | **No. of Learners** | **%** |
|---|---|---|
| Class A<br>Under 40,000 | 74 | 81.32 |
| Class B<br>40,000 – 59,999 | 14 | 15.38 |
| Class C<br>60,000 – 99,999 | 3 | 3.30 |
| Class D<br>100,000 – 249,999 | 0 | 0 |
| Class E<br>250,000 and above | 0 | 0 |
| **Total** | **91** | **100** |

Table 2 reveals that among the 91 respondents, 74 or 81.32% belong to Class A having a monthly income of under 40,000. This reflects that majority of the respondents belong to the lowest socio-economic class while no respondents fell under Class D and E. This categorization is in reference to Philippine Statistics Authority's classification of socio-economic status. This implies that most of their household income is limited to meet their basic needs and providing additional resources and materials for academic purposes is not always available. However, according to Narisma's findings (2019) socio-economic status can serve as a motivating factor for learners to strive for a brighter future.

Table 3

*Frequency Distribution of Learners According to Grade in Mathematics 10 Classification*

| Grade in Mathematics 10 | No. of Learners | % | Classification |
|---|---|---|---|
| 90 – 100 | 26 | 28.57 | Outstanding |
| 85 – 89 | 55 | 60.44 | Very Satisfactory |
| 80 – 84 | 10 | 10.99 | Satisfactory |
| 75 – 79 | 0 | 0 | Fairly Satisfactory |
| Below 75 | 0 | 0 | Did not meet Expectations |

Table 3 presents the frequency and distribution of learners according to grade in Mathematics 10. Results imply that most of the respondents performed well in Mathematics 10. However, there were still some who may have struggled to meet the expected level of proficiency. This variation in performance may be influenced by factors such as pre-knowledge and foundation, as stated by Rijal (2020). Rijal's research found that these factors directly affect learners' performance in mathematics, stating that strong foundation and prior knowledge are crucial for success in the subject.

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Table 4

*Frequency Distribution of Learners According to Completed Junior High School Program*

| Completed Junior High School Program | No. of Learners | % |
|---|---|---|
| Basic Education Program | 82 | 89.13 |
| Science, Technology and Engineering (Ste) Program | 9 | 9.78 |
| Other Completed Junior High School Program | 1 | 1.09 |
| Total | 92 | 100 |

Table 4 reveals that the majority of learners, totaling 82 respondents, completed Basic Education Program. A smaller number of respondents, 9 in total, completed Science, Technology and Engineering (STE) Program, while only 1 respondent completed other junior high school program, specifically, Alternative Learning System (ALS). This implies that few were completers of the STE program which provides learners with opportunities through an enhanced science-technology-oriented curriculum focusing on science, technology, mathematics and research. Relating to Rijal's findings (2020), this implies that completed junior high school programs may influence learners' proficiency in mathematics, where learners who completed STE Program might possess a stronger foundation in mathematical concepts (Department of Education, 2010).

Table 5

*Mastery Level of the Learners in Business Mathematics.*

| Item No. | Learning Competency | No. of Correct Response | Percentage of Achievement | Mastery Level |
|---|---|---|---|---|
| 1 | Perform fundamental operations on fractions and decimals | 76 | 82% | Moving towards Mastery |
| 2 | | 34 | 37% | Average Mastery |
| 3 | Illustrate how decimals and fractions can be written in terms of percent | 62 | 67% | Moving towards Mastery |
| 4 | | 53 | 58% | Average Mastery |
| 5 | Give real-life situations to illustrate fractions, decimals, and percent | 76 | 83% | Moving towards Mastery |
| 6 | | 82 | 89% | Close to Approximating Mastery |
| 7 | Solve problems involving fractions, decimals, and percent | 68 | 74% | Moving towards Mastery |
| 8 | | 80 | 87% | Close to Approximating Mastery |
| 9 | Compare and differentiate ratio and rate | 67 | 73% | Moving towards Mastery |

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|---|---|---|---|---|
| 10 | | 74 | 80% | Moving towards Mastery |
| 11 | Write proportions illustrating real-life situations | 51 | 55% | Average Mastery |
| 12 | | 8 | 9% | Very Low Mastery |
| 13 | | 70 | 76% | Moving towards Mastery |
| 14 | Identify the different kinds of proportion and give examples for each | 37 | 40% | Average Mastery |
| 15 | | 42 | 46% | Average Mastery |
| 16 | | 46 | 50% | Average Mastery |
| 17 | Differentiate Mark-on, Mark down and Mark-up | 67 | 73% | Moving towards Mastery |
| 18 | | 88 | 96% | Mastered |
| 19 | | 84 | 91% | Close to Approximating Mastery |
| 20 | Differentiate mark-up from margins | 67 | 73% | Moving towards Mastery |
| 21 | | 22 | 24% | Low Mastery |
| 22 | | 30 | 33% | Low Mastery |
| 23 | Illustrate how to compute single trade discounts and discount series | 38 | 41% | Average Mastery |
| 24 | | 55 | 60% | Average Mastery |
| 25 | Differentiate profit from loss | 51 | 55% | Average Mastery |
| 26 | | 55 | 60% | Average Mastery |
| 27 | Illustrate how profit is obtained and how to avoid loss in a given transaction | 49 | 53% | Average Mastery |
| 28 | | 63 | 68% | Moving towards Mastery |
| 29 | | 31 | 34% | Low Mastery |
| 30 | Define break-even; illustrate how to determine break-even point | 59 | 64% | Average Mastery |
| 31 | | 36 | 39% | Average Mastery |
| 32 | Illustrate how interest is computed specifically as applied | 45 | 49% | Average Mastery |

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|---|---|---|---|---|
| 33 | to mortgage, amortization, and on services/utilities and on deposits and loans | 65 | 71% | Moving towards Mastery |
| 34 | | 80 | 87% | Close to Approximating Mastery |
| 35 | | 88 | 96% | Mastered |
| 36 | | 84 | 91% | Close to Approximating Mastery |
| 37 | Express fractions to decimals and percent forms and vice versa | 62 | 67% | Moving towards Mastery |
| 38 | Illustrate how decimals and fractions can be written in terms of percent | 52 | 57% | Average Mastery |
| 39 | Give real-life situations to illustrate fractions, decimals, and percent | 32 | 35% | Average Mastery |
| 40 | | 73 | 79% | Moving towards Mastery |
| 41 | Solve problems involving fractions, decimals, and percent | 46 | 50% | Average Mastery |
| 42 | | 55 | 60% | Average Mastery |
| 43 | Compare and differentiate ratio and rate | 62 | 67% | Moving towards Mastery |
| 44 | Write proportions illustrating real-life situations | 62 | 67% | Moving towards Mastery |
| 45 | Solve problems involving direct, inverse and partitive proportion | 69 | 75% | Moving towards Mastery |
| 46 | | 64 | 70% | Moving towards Mastery |
| 47 | Illustrate how Mark-on, Mark-down, and Mark-up are obtained | 22 | 24% | Low Mastery |
| 48 | Describe how gross margins is used in sales | 27 | 29% | Low Mastery |
| 49 | | 34 | 37% | Average Mastery |
| 50 | Illustrate how to compute single trade discounts and discount series | 36 | 39% | Average Mastery |
| 51 | | 42 | 46% | Average Mastery |
| 52 | Differentiate profit from loss | 69 | 75% | Moving towards Mastery |
| 53 | | 40 | 43% | Average Mastery |
| 54 | Illustrate how profit is obtained and how to avoid loss in a given transaction | 50 | 54% | Average Mastery |

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|---|---|---|---|---|
| 55 | Define break-even; illustrate how to determine break-even point | 35 | 38% | Average Mastery |
| 56 | | 44 | 48% | Average Mastery |
| 57 | Solve problems involving buying and selling products | 27 | 29% | Low Mastery |
| 58 | Illustrate how interest is computed specifically as applied to mortgage, amortization, and on services/utilities and on deposits and loans | 27 | 29% | Low Mastery |
| 59 | | 80 | 87% | Close to Approximating Mastery |
| 60 | | 22 | 24% | Low Mastery |
| General Percentage of Achievement | | | 58% | Average Mastery |

Table 6 shows that from a total of 19 learning competencies in Business Mathematics covered during their third periodical examination, 1 learning competency which is about “Write proportions illustrating real-life situations” gained a very low mastery level, and 8 learning competencies gained low mastery level. These findings portray that despite of having “Moving towards Mastery” to “Mastered” competencies, the general percentage of achievement still fell under 58% or “Average Mastery” level, which can be concluded that the mastery level is far from the standard of 75% or Moving towards Mastery. According to Ereno, R. and Benavides, N. (2022), there are various factors that can hinder mastering competencies in mathematics, these include student-related, home-related, and subject-related factors. Additionally, further assessment of Lana (2023) in determining the cause of this result among learners revealed that while they can demonstrate understanding of the concepts, they encounter difficulty during applications. Lana suggested that the lack of instructional materials for teachers can be a contributing factor.

**Table 6**

*Least-Mastered Competencies of the Learners in Business Mathematics*

| Item No. | Learning Competency | No. of Correct Response | Percentage of Achievement | Mastery Level |
|---|---|---|---|---|
| 39 | Give real-life situations to illustrate fractions, decimals, and percent | 32 | 35% | Average Mastery |
| 2 | Perform fundamental operations on fractions and decimals | 34 | 37% | Average Mastery |
| 55 | Define break-even; illustrate how to determine break-even point | 35 | 38% | Average Mastery |
| 14 | Identify the different kinds of proportion and give examples for each | 37 | 40% | Average Mastery |
| 23 | Illustrate how to compute single trade discounts and discount series | 38 | 41% | Average Mastery |
| 15 | Identify the different kinds of proportion and give examples for each | 42 | 46% | Average Mastery |

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|---|---|---|---|---|
| 32 | Illustrate how interest is computed specifically as applied to mortgage, amortization, and on services/utilities and on deposits and loans | 45 | 49% | Average Mastery |
| 41 | Solve problems involving fractions, decimals, and percent | 46 | 50% | Average Mastery |
| 54 | Illustrate how profit is obtained and how to avoid loss in a given transaction | 50 | 54% | Average Mastery |
| 38 | Illustrate how decimals and fractions can be written in terms of percent | 52 | 57% | Average Mastery |
| 42 | Solve problems involving fractions, decimals, and percent | 55 | 60% | Average Mastery |

Table 6 presents the least-mastered competencies of the learners in Business Mathematics. These include the following concepts: 1) Give real-life situations to illustrate fractions, decimals, and percent, 2) Perform fundamental operations on fractions and decimals, 3) Define break-even; illustrate how to determine break-even point; 4) Identify the different kinds of proportion and give examples for each; 5) Illustrate how to compute single trade discounts and discount series; 6) Illustrate how interest is computed specifically as applied to mortgage, amortization, and on services/utilities and on deposits and loans; 7) Solve problems involving fractions, decimals, and percent; 8) Illustrate how profit is obtained and how to avoid loss in a given transaction; and 9) Illustrate how decimals and fractions can be written in terms of percent. The determination of the least-mastered competencies is needed to be able to do root-cause analysis of the low mastery level that will lead to the contextualization of a learning materials to address this concern. One approach involves the recommendations by Michael (2015), stating that teachers should first assess the background of the learners to determine the appropriate teaching methods and interventions that can improve learners' performance. Another was suggested by Mendoza (2006), that modular approach which provides structured and personalized learning experiences which can enhance understanding and retention of mathematical concepts among learners.

**Table 7**

*Least-Mastered Competencies in Business Mathematics According to Sex*

| Least-Mastered Competencies | Male | % | Female | % |
|---|---|---|---|---|
| Give real-life situations to illustrate fractions, decimals, and percent | 19 | 68% | 41 | 64% |
| Perform fundamental operations on fractions and decimals | 16 | 57% | 42 | 66% |
| Define break-even; illustrate how to determine break-even point | 12 | 43% | 45 | 70% |
| Identify the different kinds of proportion and give examples for each | 14 | 50% | 41 | 64% |
| Illustrate how to compute single trade discounts and discount series | 14 | 50% | 40 | 63% |
| Identify the different kinds of proportion and give examples for each | 14 | 50% | 36 | 56% |
| Illustrate how interest is computed specifically as applied to mortgage, amortization, and on services/utilities and on deposits and loans | 13 | 46% | 34 | 53% |
| Solve problems involving fractions, decimals, and percent | 13 | 46% | 33 | 52% |

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|---|---|---|---|---|
| Illustrate how profit is obtained and how to avoid loss in a given transaction | 11 | 39% | 31 | 48% |
| Illustrate how decimals and fractions can be written in terms of percent | 12 | 43% | 28 | 44% |
| Solve problems involving fractions, decimals, and percent | 13 | 46% | 24 | 38% |

Table 7 presents the least-mastered competencies in Business Mathematics according to sex. The table reveals that an average of 49.03% of male respondents were contributors to the least-mastered competencies, while an average of 56.11% of female respondents were contributors, indicating a higher proportion of females struggling in mastering these competencies. Armah & Akayuure (2020), found that both male and female learners achieve below average performance in mathematics, with majority attaining lower grades. Therefore, Table 8 align with these findings, indicating that both male and female respondents are facing challenges in mastering Business Mathematics competencies. This shows the importance of addressing these challenges and implementing interventions to improve overall mastery of Business Mathematics competencies among both male and female learners.

**Table 8**

*Correlation Between Least-Mastered Competencies in Business Mathematics and Sex.*

| Group | | Male | Female |
|---|---|---|---|
| Male | Pearson's r | --- | |
| | p-value | --- | |
| Female | Pearson's r | 0.4659 | --- |
| | p-value | 0.1486 | --- |

Table 16 shows the correlation between the least-mastered competencies and sex. The result shows a low positive relationship between the male and female respondents with a Pearson's r value of 0.4659. However, the relationship is not significant, as indicated by a p-value of 0.1486. This suggests that the relationship between sex and least-mastered competencies in Business Mathematics could be occurred by chance. These findings align with the research conducted by Opstad (2024), which suggests that the traditional gender difference in Business Mathematics has narrowed. Additionally, research by Alcantara & Abanador (2018) indicates that there is no gender difference in learning strategies accounted for male and female learners in terms of mathematics proficiency.
This finding suggests that factors other than sex or gender may influence the mastery of these competencies. This includes considering socio-cultural influences, wherein, this may influence participation and learning mathematics (lipinge, 2014).

**Table 9**

*Least-Mastered Competencies in Business Mathematics According to Monthly Household Income*

| **Least-Mastered Competencies** | **Class A** | **%** | **Class B** | **%** | **Class C** | **%** |
|---|---|---|---|---|---|---|
| Give real-life situations to illustrate fractions, decimals, and percent | 50 | 68% | 7 | 47% | 2 | 67% |
| Perform fundamental operations on fractions and decimals | 48 | 66% | 8 | 53% | 1 | 33% |
| Define break-even; illustrate how to determine break-even point | 43 | 59% | 11 | 73% | 2 | 67% |

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|---|---|---|---|---|---|---|
| Identify the different kinds of proportion and give examples for each | 47 | 64% | 5 | 33% | 2 | 67% |
| Illustrate how to compute single trade discounts and discount series | 43 | 59% | 8 | 53% | 2 | 67% |
| Identify the different kinds of proportion and give examples for each | 43 | 59% | 5 | 33% | 2 | 67% |
| Illustrate how interest is computed specifically as applied to mortgage, amortization, and on services/utilities and on deposits and loans | 41 | 56% | 5 | 33% | 0 | 0% |
| Solve problems involving fractions, decimals, and percent | 37 | 51% | 6 | 40% | 2 | 67% |
| Illustrate how profit is obtained and how to avoid loss in a given transaction | 35 | 48% | 5 | 33% | 1 | 33% |
| Illustrate how decimals and fractions can be written in terms of percent | 34 | 47% | 3 | 20% | 2 | 67% |
| Solve problems involving fractions, decimals, and percent | 28 | 38% | 6 | 40% | 2 | 67% |

Results in Table 9 show that respondents categorized under Class A, with the lowest monthly household income, gained the highest mean percentage of 55.90% of compared to other categories. Class B gained the lowest mean percentage of 41.80%. Additionally, respondents categorized under Class C gained a mean percentage of 54.50%. The majority of the respondents are categorized under Class A, which has the lowest monthly household income. This finding could direct the possibility that learners from lower socio-economic status may face challenges in mastering learning competencies in Business Mathematics. This aligns with the findings of Das, G. & Sinha, S. (2017), indicating that socio-economic status directly affects learners' performance in mathematics.

**Table 10**

*Correlation Between Least-Mastered Competencies in Business Mathematics and Monthly Household Income.*

| Group | | Class A | Class B | Class C |
|---|---|---|---|---|
| Class A | Pearson's r | --- | | |
| | p-value | --- | | |
| Class B | Pearson's r | 0.393 | --- | |
| | p-value | 0.2318 | --- | |
| Class C | Pearson's r | -0.0387 | 0.1449 | --- |
| | p-value | 0.9117 | 0.6708 | --- |

Results in Table 10 reveal that there is a low positive correlation between Class A category and Class B category (r=0.393). However, the relationship is not significant as indicated the p-value of 0.2318. Similarly, the correlation between Class C and Class A, and Class B resulted Pearson's r values of -0.0387 and 0.1449, respectively. The relationships were not only negligible but also insignificant (p-value of 0.9117 and 0.6708). Thus, socio-economic status does not influence the least-mastered competencies in Business Mathematics. These findings contradict the conclusion of Mason (2013) that socio-economic status, such as household income, is a factor in influencing the academic achievement of learners, which aligns with the conclusions of Naria (2019) and Fallaria (2019), that socio-economic status can serve as a motivating factor for learners to excel academically and value learning more. However, Das, G. & Sinha, S. (2017) stated that components of socio-economic status such

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as father's income, occupation, and monthly family income, directly affects learners' performance in mathematics. While socio-economic status has been identified as potential factor in influencing academic achievement by some researchers, the findings in this study suggests otherwise.

**Table 11**

*Least-Mastered Competencies in Business Mathematics According to Grade in Mathematics 10*

| Least-Mastered Competencies | Outstanding | % | Very Satisfactory | % | Satisfactory | % |
|---|---|---|---|---|---|---|
| Give real-life situations to illustrate fractions, decimals, and percent | 11 | 42% | 41 | 75% | 7 | 70% |
| Perform fundamental operations on fractions and decimals | 8 | 31% | 41 | 75% | 8 | 80% |
| Define break-even; illustrate how to determine break-even point | 10 | 38% | 40 | 73% | 6 | 60% |
| Identify the different kinds of proportion and give examples for each | 7 | 27% | 40 | 73% | 7 | 70% |
| Illustrate how to compute single trade discounts and discount series | 12 | 46% | 35 | 64% | 6 | 60% |
| Identify the different kinds of proportion and give examples for each | 5 | 19% | 39 | 71% | 6 | 60% |
| Illustrate how interest is computed specifically as applied to mortgage, amortization, and on services/utilities and on deposits and loans | 4 | 15% | 35 | 64% | 7 | 70% |
| Solve problems involving fractions, decimals, and percent | 5 | 19% | 30 | 55% | 10 | 100% |
| Illustrate how profit is obtained and how to avoid loss in a given transaction | 8 | 31% | 25 | 45% | 8 | 80% |
| Illustrate how decimals and fractions can be written in terms of percent | 3 | 12% | 28 | 51% | 8 | 80% |

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|---|---|---|---|---|---|---|---|
| Solve problems involving fractions, decimals, and percent | 7 | 27% | 23 | 42% | 6 | 60% |

Table 11 reveals that learners with an “Outstanding” performance in Mathematics 10 have a mean percentage of 28%, while those who attained a “Very Satisfactory” and “Satisfactory” performance in Mathematics 10 gained mean percentages of 62% and 71%, respectively. This finding suggests that learners who excel in Mathematics 10 tend to demonstrate higher performance in Business Mathematics and those with lower performance in Mathematics 10 face challenged in mastering Business Mathematics competencies. Since, the respondents’ grade in Mathematics 10 can be considered as a component of their mathematical background, Opstad (2024) concluded that grade in Mathematics 10 can influence the performance in business mathematics.

**Table 12**

*Correlation Between Least-Mastered Competencies in Business Mathematics and Grade Classifications in Mathematics 10*

| Group | | Outstanding | Very Satisfactory | Satisfactory |
|---|---|---|---|---|
| Outstanding | Pearson’s r | --- | | |
| | p-value | --- | | |
| Very Satisfactory | Pearson’s r | 0.3452 | --- | |
| | p-value | 0.2985 | --- | |
| Satisfactory | Pearson’s r | -0.4009 | -0.2572 | --- |
| | p-value | 0.2216 | 0.4455 | --- |

Results in Table 12 reveal that there is a low positive correlation between learners who achieved an “Outstanding” Grade in Mathematics 10 and those who achieved a “Very Satisfactory” (r=0.3452). However, the relationship is not significant as indicated the p-value of 0.2985. Additionally, there is a low negative correlation between the learners who got a “Outstanding” and “Satisfactory” Grade in Mathematics 10 (r=-0.4009) and negligible correlation between the learners who got a “Very Satisfactory” and “Satisfactory” Grade in Mathematics 10 (r=-0.2572) and both were not significant with p-values of 0.2216 and 0.4455, respectively. These findings suggest that grades achieved in Mathematics 10 do not influence the least-mastered competencies in Business Mathematics. It can be inferred that factors other than grades in Mathematics 10 may have an influence in determining mastery in Business Mathematics competencies.
Furthermore, research by Opstad (2024) suggests that there are no connections between GPA from previous level to the achievement in business mathematics, and that to excel in mathematics, including business mathematics, special skills are required.

**Table 13**

*Least-Mastered Competencies in Business Mathematics According to Completed Junior High School Program*

| **Least-Mastered Competencies** | **BEC** | **%** | **STE** | **%** |
|---|---|---|---|---|
| Give real-life situations to illustrate fractions, decimals, and percent | 58 | 71% | 1 | 11% |
| Perform fundamental operations on fractions and decimals | 56 | 68% | 1 | 11% |
| Define break-even; illustrate how to determine break-even point | 54 | 66% | 2 | 22% |

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|---|---|---|---|---|
| Identify the different kinds of proportion and give examples for each | 51 | 62% | 3 | 33% |
| Illustrate how to compute single trade discounts and discount series | 49 | 60% | 4 | 44% |
| Identify the different kinds of proportion and give examples for each | 50 | 61% | 0 | 0% |
| Illustrate how interest is computed specifically as applied to mortgage, amortization, and on services/utilities and on deposits and loans | 46 | 56% | 0 | 0% |
| Solve problems involving fractions, decimals, and percent | 44 | 54% | 1 | 11% |
| Illustrate how profit is obtained and how to avoid loss in a given transaction | 40 | 49% | 1 | 11% |
| Illustrate how decimals and fractions can be written in terms of percent | 38 | 46% | 1 | 11% |
| Solve problems involving fractions, decimals, and percent | 35 | 43% | 1 | 11% |

Table 13 show that learners who completed the Basic Education Curriculum (BEC) have a higher mean percentage of 57.80%, while learners who completed the Science, Technology and Engineering (STE) Program got a mean percentage of 15.20%.
This implies that learners who completed STE Program tend to demonstrate higher performance in Business Mathematics, contributing a lower proportion of percentage to the least-mastered competencies. The implementation of STE Program by the Department of Education, as stipulated in the DepEd Order No. 55 S. 2010, aimed to enhance science and mathematics education at the secondary level in the Philippines. Consequently, learners who completed STE program are expected to excel more in mathematics, including Business Mathematics, compared to BEC completer.

**Table 14**

*Correlation Between Least-Mastered Competencies in Business Mathematics and Completed Junior High School Program*

| Group | | BEC | STE |
|---|---|---|---|
| **BEC** | **Pearson's r** | **---** | |
| | **p-value** | **---** | |
| **STE** | **Pearson's r** | **0.195** | **---** |
| | **p-value** | **0.566** | **---** |

Table 14 presents the correlation between the least-mastered competencies in Business Mathematics and completed junior high school program. The result shows a negligible correlation between completion of Basic Education Curriculum (BEC) and Science, Technology and Engineering (STE) Program in junior high school and the least-mastered competencies in Business Mathematics (r=0.195), and this relationship is not significant with the p-value of 0.566. This means that completion of either the BEC or the STE program in junior high school does not predict the least-mastered competencies in Business Mathematics. This finding suggests that factors other than completed junior high school program may influence the mastery of these competencies. Ereno & Benavides (2022) suggest several factors including lack of educational resources, instructional supervision, difficulty in comprehending math problems, and boredom from repetitive activities could influence the learners' capacity to learn mathematical concepts.

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## CONCLUSIONS AND RECOMMENDATIONS

The study surveyed 92 Grade 11 ABM learners at Solano High School. Respondents were predominantly female and belonged largely to the lowest socio-economic class (Class A: <P40,000 monthly income). While most had strong prior performance in Math 10 ("Very Satisfactory" or "Outstanding"), the majority were Basic Education Program (BEC) completers. Mastery Level: The learners' overall performance in Business Mathematics was "Average Mastery" (58% achievement), falling below the desirable standard of 75%. Mastered Competencies (LMCs): Nine specific competencies were identified as LMCs, including fundamental operations (fractions/decimals/percent), solving worded problems, break-even analysis, trade discounts, profit/loss, and complex interest calculation (mortgage/amortization). No statistically significant relationship was found between the LMCs and any demographic variable tested (sex, monthly household income, Math 10 grade, or JHS program completion). This suggests that factors other than these background variables are responsible for the low mastery. Finally, the study established seven criteria for developing contextualized learning materials (CLMs), emphasizing alignment with competencies, scope, flexible delivery, access/equity, and comprehensive content.

### Recommendations

To address the low mastery and support the Grade 11 ABM learners, the following is recommended the researcher/school must immediately develop and implement contextualized learning materials focused specifically on the identified least-mastered competencies to enhance mastery levels and provide assistance or access to educational resources for financially challenged students (Class A) to mitigate any potential resource disparity. There is a need to implement a collaborative strategy between Mathematics and Language teachers to improve students' skills in understanding and solving worded problems, as many LMCs involve application and comprehension. Mathematics teachers should conduct lesson study focused on LMCs that are part of the basic mathematical foundation, ensuring stronger baseline knowledge. Future Research Direction: Future research should explore socio-cultural influences and address specific gaps in learners' prior knowledge of foundational concepts before they enter the Business Mathematics subject.

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