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| RESEARCH ARTICLE

Strategies and Common Errors in Solving Basic Mathematics Problems among University of Cebu-Main Freshman BEED Students

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| ABSTRACT

This study identified the strategies employed and common errors committed by freshman BEED students in Solving Basic Mathematics problems. It emphasized the enhancement of the identified strategies through the implementation of a tutorial program. Identifying the common errors made by the respondents in the study will make students aware of their presence and prepare them for their exposure to such problem-solving situations. In effect, these identified errors will be minimized if not totally put to end. Three (3) strategies and common errors were revealed in the study. The three (3) strategies were identifying the target goal, identifying the key information, and drawing diagrams/tables. The three (3) common errors were being unable to derive and identify the correct working equation, being unable to label the final answer, and being unable to use the least common denominator in adding and subtracting fractions. To determine the relationship between the respondents' achievement in basic mathematics and their achievement in high school mathematics, attitude towards mathematics, and attitude towards the teacher, the Pearson *r* and the t–tests were computed. The results indicate a noteworthy correlation between students' performance in High School Mathematics and their achievement in Basic Mathematics. However, no significant relationships were observed among the remaining paired variables. In conclusion, a strong foundation in mathematics helps students strategize their solutions to worded problems well, thereby getting rid of errors along the way.

| KEYWORDS

Mathematics Achievement, Problem Solving Strategies, Descriptive-correlational, Common Errors

| ARTICLE INFORMATION

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1. Introduction

Failure in basic mathematics is the most common problem encountered by students, specifically in problem-solving. Some consider it to be the most challenging but integral part of mathematics. It is where an individual develops his analytical skills in solving word problems. Despite this fact, it still creates boredom and uneasiness in students once they hear the concept from the teacher. Looking at Problem-solving as very difficult makes them less interested in the subject matter, especially when they are made to analyze problems.

The ability to analyze and solve problems is only innate to some since it is a skill that needs constant practice, patience, and the right attitude towards the subject. A good foundation on the basic concepts in Mathematics is of great help. It is this ability to solve problems that is considered the Waterloo of most students. This is what makes them avoid taking courses that are loaded

with Mathematics, more so those with problem-solving, in which they are prone to committing mistakes in formulating the working equation.

As the researchers have observed, the common mistakes of the students are in the derivation of the correct working equation in solving problems with less time and effort. This may be the result of their poor ability to analyze word problems. There are also students who are keen enough to solve word problems, where it only takes a little time for them to analyze and devise plans to arrive at the correct equation, which will subsequently lead them to the correct answer.

These observations challenged the researchers to study the various strategies and common errors made by the freshman BEED students in solving problems in basic mathematics. There have been studies conducted about achievement and common errors among students, but very few studies have been conducted on strategies and standard errors, thus the birth of this study.

2. Framework

This paper is anchored on the Cognitive Load Theory by Sweller in 1988 with Schema Theory by Anderson in 1983 and Social Constructivism by Vygotsky in 1978 as supporting theories. Cognitive Load Theory (CLT) and Schema Theory are essential in understanding how students approach mathematical problems.

Cognitive Load Theory (CLT) suggests that learning is most effective when intrinsic load is high and extrinsic load is low. This means that the material should be challenging, but it should also be presented in a way that minimizes distractions and cognitive overload. It has been used to design instructional materials and to improve teaching methods. It has also been used to explain why some students have difficulty learning certain subjects. This theory implies that instruction should be designed to minimize extraneous cognitive load. This means that instructional materials should be clear and concise, and they should avoid using complex diagrams or multiple steps in a problem. Instruction should focus on the essential elements of the material. This means that teachers should only try to teach a little at a time, and they should focus on the most important concepts. Instruction should provide opportunities for students to practice and apply the material. This helps students to integrate and rehearse the information, which reduces extraneous cognitive load. Instruction should be adapted to the individual learner's needs. Some students may need more support than others in order to manage cognitive load. Cognitive load theory is a complex theory, but it has important implications for education. By understanding the limits of working memory, teachers can design instruction that is more effective and efficient (Plass et al., 2010).

Support for the CLT is the Schema Theory by Anderson in 1983, which says that schemas are mental frameworks that represent knowledge about a particular topic or domain. They are made up of interconnected pieces of information, such as concepts, facts, and procedures. Schemas are used to interpret new information and to make predictions about the world. When encountering new information, we assimilate it into our existing mental frameworks or schemas. If the new information aligns with these schemas, we are more inclined to comprehend and retain it. If the new information is inconsistent with our schemas, we may need to modify our schemas in order to accommodate it. Schemas are essential for learning and memory. They help us to organize and store information in a way that makes it easier to retrieve. They also help us to make sense of new information and to draw inferences about the world. These schemas can affect students' methods and mistakes, and understanding how schemas align with successful problem-solving techniques can help direct students toward more correct approaches (Nickles, 2000). Another support to the Cognitive Load Theory is the Social Constructivism Theory by Vygotsky in 1978, which says that learning is a social process that takes place in a cultural context. It emphasizes the importance of social interaction and group collaboration in education, and understanding how these factors affect students' problem-solving techniques and mistakes can help improve learning outcomes. The anchored theory, in combination, stresses that learning information goes through a process, and the heavier the load of information is, the lesser the learning process will be. The more complicated the information students receive, the less absorption there will be, causing them to also learn less, especially in the subject of mathematics (Lesh et al., 2003).

Mathematics is a cumulative expanding subject in both its organization and its application. When a teacher introduces a new topic, they face fundamental instructional challenges, including 1) assisting students in grasping new concepts and relationships initially, 2) guiding them to enhance and deepen their understanding well beyond the basic level, 3) supporting them in retaining previously acquired knowledge and skills, and 4) aiding them in establishing a foundation for applying skills and understanding in real-life situations (Butler & Wren, 1961) (Reeves & Heibert, 2016).

According to Bertrand Russell, as cited by Smith (1983), Mathematics, when rightly understood, exhibits supreme beauty. This beauty is cool and austere, akin to sculpture, devoid of the ornate embellishments of painting or music. However, it possesses a sublime purity and the potential for a rigorous perfection comparable to the finest art. The pure joy, the elevation, and the feeling of transcending ordinary limits, which characterize the pinnacle of excellence, can be discovered in Mathematics as distinctly as in poetry (Manin, 2018).

The education of the students in the nature of Mathematics is a logical system. One must realize the precise importance of definitions and explicitly state that hypotheses are necessary, that any system of mathematics may affect one's life, and how one can put it to work for oneself. Learning Mathematics is more enjoyable if one can see how people put it to use (Vance, 1977) (Rasmussen & Zandieh, 2017). One factor to consider in learning mathematics is the student's attitude toward it.

With regard to attitudes towards the subject, Ray (1990) stated that negative attitudes towards mathematics affect students' performance in the subject (Wigfield et al., 2016). However, it was contradicted by the following persons: Cabrera (1990), who found that there was a significant correlation between students' attitude towards the subject and their achievement in the subject; Arcales (1992), who found that students who had a favorable attitude towards Mathematics tend to show high achievement in Mathematics. Razonable (1998) also said that there was a significant relationship between the student's previous learning in Mathematics and in their achievement in Analytic Geometry (Chouinard et al, 2007). The relationship between attitude toward mathematics and ability in the subject has been found to be interactive and dynamic, according to Rech and Stevens in 1996 and Zhang et al. in 2021.

That was the attitude of students towards Mathematics and their performance in the subject. What about their performance as regards their teacher's performance? Is there a chance? Razonable(1998) and Zhang et al. (2021) have something to say on this. They said, "There was no sufficient evidence of the significant relationship between teacher performance and the student's achievement in analytic Geometry ."Teacher performance is one of the factors which may affect students' attitudes towards the subject. However, this was contradicted by Kumar (1993), who stated that the students' attitudes toward mathematics and the teacher are significantly related and that the teacher's personality and abilities influence students. His skill in connecting the subject to real-life situations will significantly contribute to motivating the learner (Özdemir & Demir, 2021). Kumar's contradictory statement implies that, indeed, the student's learning depends on how the teacher imparts his/her knowledge to the students.

It is but a known reality that Mathematics entails difficulty and perplexities in a student's life, the very reason for the existence of Problem-solving activities. They are purposeful as they remove a difficulty or perplexity through a process of reasoning. Reflective thinking is utilized, and it consists of two phases: 1) a statement of the perplexity or difficulty that gives rise to thinking, and 2) the act of searching or inquiring as a teaching procedure. Of course, the activity will contain good problems with the following characteristics: 1) a difficulty exists that demands a thought-provoking solution;2) it should be clear, definite, and suitable to the level of the students and of practical value and 3) it is accurate, engaging, and worthwhile to the class (Lardizabal et al., 1991) (Henderson, 2020).

In relation to the problem-solving process, Risk (1965) pointed out the essential steps in problem-solving, which are: 1) recognition and statement of the Problem, originating in a difficulty or perplexing situation, 2) statement of the hypothesis – inspection and proposal or solution, 3) critical evaluation of a suggested solution, and 4) verification of an accepted solution (Sternberg, 2007). These steps in problem solving can also be utilized by students and get an enjoyable experience.

Engaging in mathematical puzzles and addressing real-life problems can be a pleasurable experience. Angel (1989) outlines Polya's four steps to problem-solving: 1) comprehend the Problem, 2) create a plan, 3) implement the plan, and 4) evaluate the results (Sternberg, 2007).

The theories mentioned above will aid researchers in identifying the strategies used by the respondents in solving word problems and the standard errors they commit during the process.

3. Objectives of the Study

This study sought to determine the different strategies and common errors in solving word problems in Basic Mathematics among the Freshman University of Cebu BEED students.

4. Methodology

This research utilized the descriptive–correlational method since its main concern was to determine the strategies and common errors in solving Basic Mathematics problems. Furthermore, the descriptive method of research can describe clearly the degree of an existing relationship between any of the two compared variables. This study was mainly a correlational study utilizing the data gathered through questionnaires and documentary records.

The subjects of the study were selected from the freshman BEED students taking Math 1B, which is Basic Mathematics at the University of Cebu. This study was conducted at the University of Cebu South Campus, a private, non-sectarian educational institution owned and managed by Atty. Augusto W. Go together with his daughter Ms. Candice Yvette G. Gotianuy. It is located

at the heart of Cebu City, Philippines. The sample of the study was randomly selected from the four (4) sections of the freshman BEED students taking Math 1B. The population size was 200.

The Aiken Dreger Attitude test questionnaire was used for this study. A teacher-made test on problem-solving was also given to the respondents, which was then used as the basis for the identification of the strategies and common errors.

4.1 Data Gathering Procedure

A written request to administer the instruments was made by the researcher in order to ask permission from the Dean of the College of Education and the teacher handling the subject to conduct the research. The instruments were then personally administered by the researcher with the help of the teacher handling the subject. The researcher discussed the proper way of filling out the questionnaires to ensure that the respondents would understand each item. The respondents were then encouraged to ask questions if they needed clarification on what they were answering.

The achievement grades in Math 1R and Math 1B were obtained from the records of the Registrar and the Education Department. The students' achievement grades in high school mathematics were taken from the respondents' final grades in Math 1R, a prerequisite subject to Math 1B.

4.2 Treatment of the Data

The following statistical tools were employed in order to analyze and interpret the gathered data: Simple percentages, Means, Pearson r, and the t–test of Significance.

5. Results and Discussion

5.1 Respondents' Achievement in High School Mathematics

Table 1

Distribution of Students in Terms of Achievement In High School Mathematics

Performance	Frequency(f)	Percentage(%)
Excellent (1.0)	0	0
Very Good (1.5-1.1)	2	1.5
Good (2.5-1.6)	63	47.37
Fair (2.9-2.6)	57	42.86
Passed (3.0)	11	8.27
Total	133	100.00
Mean = 2.51	SD = 0.49	

As reflected in Table 1, the overall standing of the learners' in their achievement in High School Mathematics was Good. The computed SD of 0.49 which is quite very small revealed that the respondents were homogeneous. Furthermore, the table reveals that most of the respondents fall under the good category in terms of their achievement in high school mathematics. This could indicate that most of the respondents did acquire the necessary skills in High School Mathematics in order for them to be ready to take up Basic Mathematics.

5.2 Respondents' Achievement in Basic Mathematics

Table 2

Distribution of Students in Terms of Achievement in Basic Mathematics

Performance	Frequency(f)	Percentage(%)
Excellent (1.0)	0	0
Very Good (1.5-1.1)	3	2.25
Good (2.5-1.6)	72	54.14
Fair (2.9-2.6)	35	26.31
Passed (3.0)	0	0
Total	133	100.00
Mean = 2.54	SD = 0.43	

Reflected in Table 2, the overall standing of the learners' in their achievement in High School Mathematics was Good. The computed SD of 0.49 which is quite very small revealed that the respondents were homogeneous. The information in Table 2 indicates that the students have attained an admirable level of mathematical competency. A high degree of homogeneity among

the respondents is implied by the exceptionally low standard deviation of 0.49, showing a constant level of performance among the group.

5.3 Respondents' Attitude towards Mathematics

Table 3
Distribution of Students in Terms of Attitude Towards the Mathematics

Attitude	Ranges for Mean	Frequency(f)	Percentage(%)
Strongly Positive	3.25-4.00	8	6.02
Positive	2.50-3.26	100	75.18
Negative	1.75-2.56	25	18.80
Strongly Negative	1.00-1.76	0	0
Total		133	100
Mean = 2.80		SD = 0.33	

As shown in Table 3, eight (8) respondents or 6.02 had strongly Positive attitude. One hundred (100) or 75.18 percent of the total respondents showed a Positive attitude towards Mathematics. Twenty five (25) or 18,80 percent of the respondents were under the Negative Attitude category and zero (0) under the Strongly Negative category. Based on the overall mean which was 2.80, the responses of the respondents manifested a Positive attitude towards Mathematics. The computed SD of 0.33 which is quite very small revealed the respondents were homogeneous which only means that the respondents were having similar traits or attitude towards Mathematics.

The attitude towards Mathematics was Positive. The findings showed that the students' were decisive in their stand towards learning Mathematics. The students found Mathematics very interesting, enjoyable, fascinating etc. These were based on the findings of the leading indicators of positive and negative attitudes. Attitude as a factor that has a direct bearing on the performance in Mathematics was contradicted by the findings of the study that students' achievement in Basic Mathematics was not significantly related to their towards Mathematics even if the students exhibit positive attitude towards Mathematics which resulted to a good achievement in Basic Mathematics. However, this was contradicted by Ray (1990), which stated that negative attitude towards Mathematics affect the students' performance in the subject. On the other hand, Blair, Jones, and Simpson (1967). Stated that the learner who has a positive attitude towards the school will work more effectively and achieve more nearly his capacity.

Table 4
Indicators of Positive Attitude Towards Mathematics

Statement	Weighted Mean	Overall Answer
1. Mathematics is very interesting to me, and I enjoy Mathematics course.	3.01	A
2. Mathematics is fascinating and fun.	2.84	A
3. Mathematics makes me feel secure, and at the same time stimulating.	2.81	A
4. The feeling that I have towards Mathematics is a positive feeling.	2.90	A
5. Mathematics is something I enjoy a great deal.	2.90	A
6. I really like Mathematics.	2.69	A
7. Mathematics is a course in school, which I have always enjoyed studying.	2.76	A
8. I am happier in Mathematics class than in any another class.	2.62	A
9. I feel at ease in Mathematics and like it very much.	2.71	A
10. I feel a definite positive reaction to Mathematics, it's enjoyable.	2.83	A
Aggregate Mean	2.81	A

The Positive attitude scale shown in Table 4 has 10 items. Of the said items, the respondents' overall attitude mean of 2.81 fall within the range of 2.50 - 3.24 which means that the respondents generally have Positive attitude towards Mathematics.

Table 5
Indicators of Negative Attitude Towards Mathematics

Statement	Weighted Mean	Overall Answer
1. I am always under a terrible strain in Mathematics class.	2.50	D
2. I don't like Mathematics and it scares me to take it.	2.99	D
3. My mind goes blank and I am unable to think clearly when working with Mathematics.	2.85	D
4. I feel a sense of insecurity when attempting to work with Mathematics.	2.86	D
5. Mathematics makes me feel uncomfortable, restless, irritable and impatient.	2.99	D
6. Mathematics makes me feel as if I am almost lost in a jungle of numbers and I can't find my way out.	2.66	D
7. When I hear the word Mathematics I have a feeling of dislike.	2.90	D
8. I approach Mathematics with a feeling of hesitation, resulting from a fear of not being able to do it.	2.65	D
9. It makes me nervous to even think about having to do .	2.50	D
10. I have never liked Mathematics.	3.00	D
Aggregate Mean	2.79	D

Table 5 shows the Negative Attitude statements. As seen in the Table, the aggregate mean of all negative attitudes is 2.79 which means that the respondents generally have no negative attitude towards Mathematics.

5.4 Respondents' Attitude towards the Teacher

Table 6
Distribution of the Students in Terms of Attitude Towards the Teacher

Attitude	Ranges for Mean	Frequency(f)	Percentage(%)
Strongly Positive	3.25-4.00	33	24.81
Positive	2.50-3.26	84	63.16
Negative	1.75-2.56	16	12.03
Strongly Negative	1.00-1.76	0	0
Total		133	100
Mean = 3.00		SD = 0.38	

As shown in Table 6, thirty three respondents (33) or 24.81 percent has Strongly Positive attitude towards the teacher. Eighty four (84) or 63.16 percent of the total respondents showed a Positive attitude towards the teacher. Sixteen (16) or 12.03 percent were under the Negative attitude category and zero (0) under the Strongly Negative attitude category. Based on the overall mean which is 3.00, the responses of the respondents manifested Positive attitudes towards the teacher. The computed SD of .38 which quite very small revealed that the respondents were homogeneous which only mean that the respondents were having similar traits or attitude towards the teacher.

The attitude towards the teacher was Positive. The findings showed the students' decisive stand towards learning. The students found the teacher very accommodating, and approachable which made them become more motivated and interested to attend classes. These were based on the findings of the leading indicators of positive and negative attitudes towards the teacher. Students' attitude towards the teacher could be a factor that a direct bearing on the performance in Mathematics, although the findings of the study showed that the students' achievements in Basic Mathematics was not significantly related to their attitude towards the teacher, still it resulted in a good achievement in Basic Mathematics. A teacher who is enthusiastic can and can communicate the importance of problem solving will make his students exert more effort needed to improve their problem solving skills (Charles, Lester and O'Daffer, 1987).

Table 7
Indicators of Positive Attitude toward the Teacher

Statement	Weighted Mean	Overall Answer
1. I like my teacher very much as he/she helps me learn new knowledge and enjoy the subject.	3.09	A
2. My teacher fascinates me and provides fun in class.	2.86	A
3. He/She makes me feel secure, and at the same time stimulates me to learn more.	3.15	A
4. The feeling that I have towards my teacher is a positive.	3.21	A
5. I really like my teacher.	3.27	SA
Aggregate Mean	3.11	A

Table 7 shows the Positive attitude statements toward the teacher. As seen in the data above, the aggregate mean of all Positive attitudes toward the teacher is 3.11 which means that students generally have Positive attitude toward their teacher.

Table 8
Indicators of Negative Attitude Towards the Teacher

Statement	Weighted Mean	Overall Answer
1. I always feel terrible when I see my teacher.	3.01	D
2. My mind goes blank, and I am unable to think clearly when my teacher in in front of the class.	3.03	D
3. He/She makes me feel as if I am almost lost in a jungle of number and I cannot find my way out.	2.84	D
4. I approach him/her with a feeling of hesitation, resulting from a fear of not being able to get the correct answer.	2.70	D
5. It makes me nervous to even think about my teacher.	2.92	D
Aggregate Mean	2.90	D

Table 8 shows the Negative attitude statements towards the teacher. As seen in the data above the aggregate mean of all Negative attitudes towards the teacher is 2.90 which means that the students generally have no Negative attitude towards their teacher.

5.5 Strategies in Solving Basic Mathematics Problems

The researcher-made test was administered in the presence of the teacher who handled the four classes under study. Checking was done the following meeting with the help of the respondents so that they will be able to know the result of the said test. The following strategies were identified by the researcher based on the administered teacher-made test.

Strategy A: Identifying the Target Goal. I this particular strategy, the respondents made use of the four steps suggested by Polya (1945) in solving problems. The respondents started with 1) understanding the problem; 2) devising a plan and find the right equation; 3) carry out the plan and 4)examining the results where checking of the answer was made by the respondents. The attainment of the correct response greatly depends on the respondents' ability in choosing the right working equations in a particular problem.

Based on the sample solutions, the student started solving the problem by following the steps introduced by their teacher in working with problems. First, was the identification of the given and what is the required followed by the solution where the identification and the derivation of the right working equation was done. After the identification of the working equation, it was carried out and by the time the correct response was achieved the students examined the results and checked it if it was really the right answer.

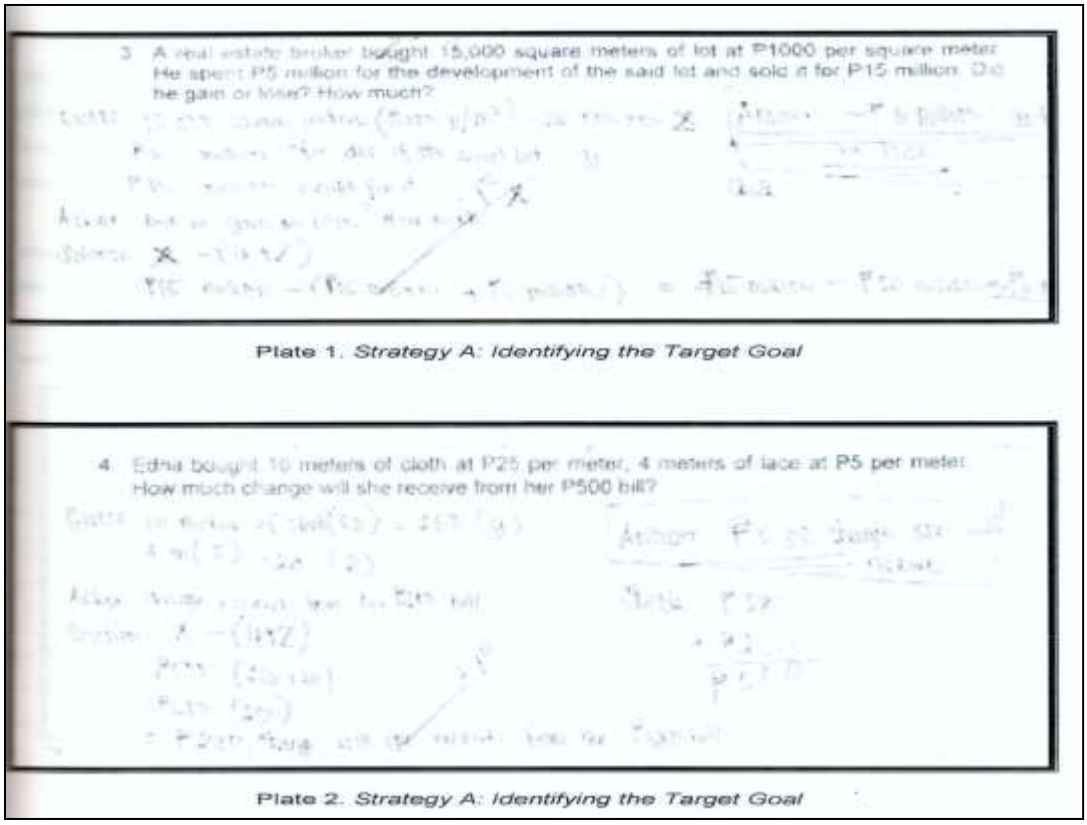

Plate 1. *Strategy A: Identifying the Target Goal*

Plate 2. *Strategy A: Identifying the Target Goal*

Strategy B: Identifying the Key Information. In this strategy, the respondents still applied Polya's 4 steps in solving problems, but this time the respondents already identified the important information in every problem that they are solving which would guide them to the right solution and consequently would also lead them to the correct answer.

Sample Strategy B showed the students started solving the problem by identifying the important information needed in solving the problem. They also used Polya's steps in solving problems. In this particular strategy, students enumerated the essential data and labeled them properly and that by the time they were deriving the working equation, it would be easy for them to substitute such data to the equation.

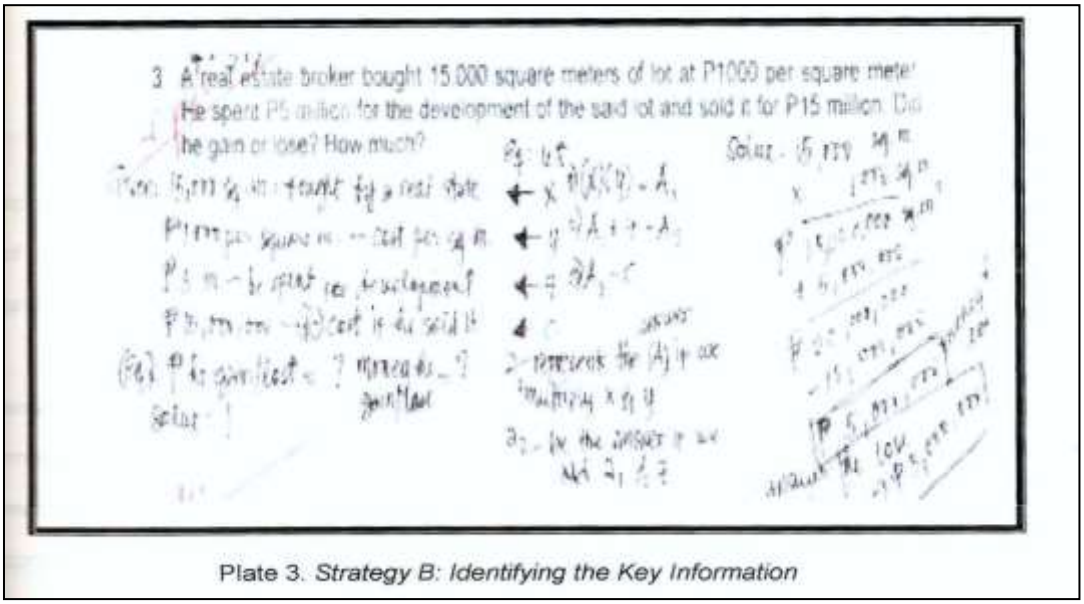

Plate 3. *Strategy B: Identifying the Key Information*

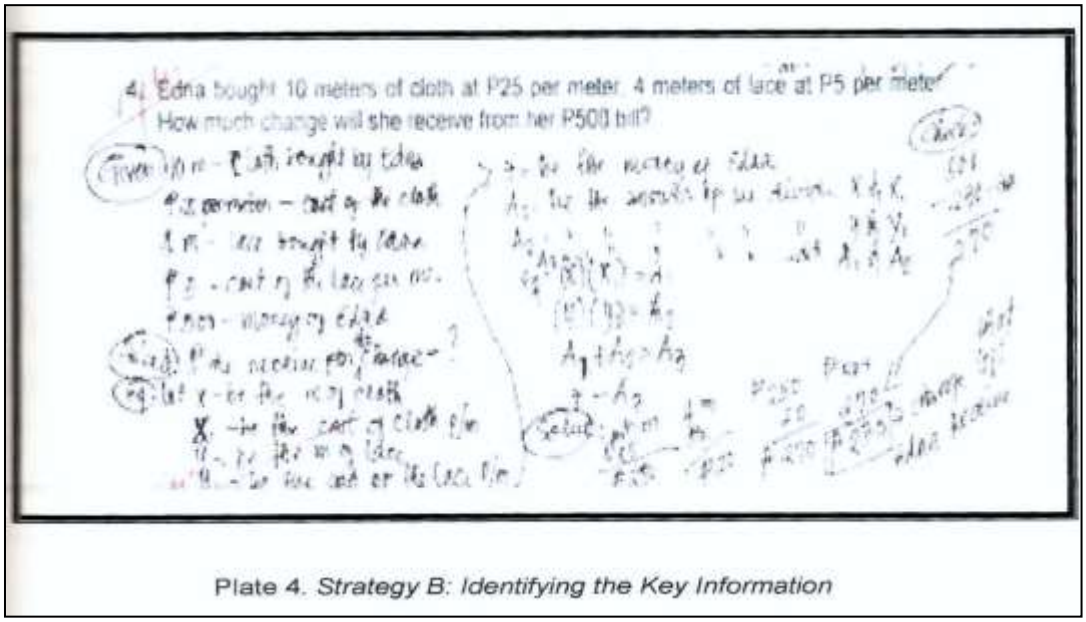

Plate 4. *Strategy B: Identifying the Key Information*

Strategy C: Drawing of Diagram/Tables. In this strategy, the respondents still applied Polya's 4 steps in solving problems but this time they integrate it with the drawing of diagrams and Tables which could make them picture out more easily that the problem is all about.

Sample strategy C on the next page showed that the students still employed Polya's steps in solving problems. In this strategy, it was clearly manifested by the students the importance of tabulating the gathered data and drawing them in a more useful way made them solve a problem with less time and effort in choosing the right equation which consequently led them to the correct response.

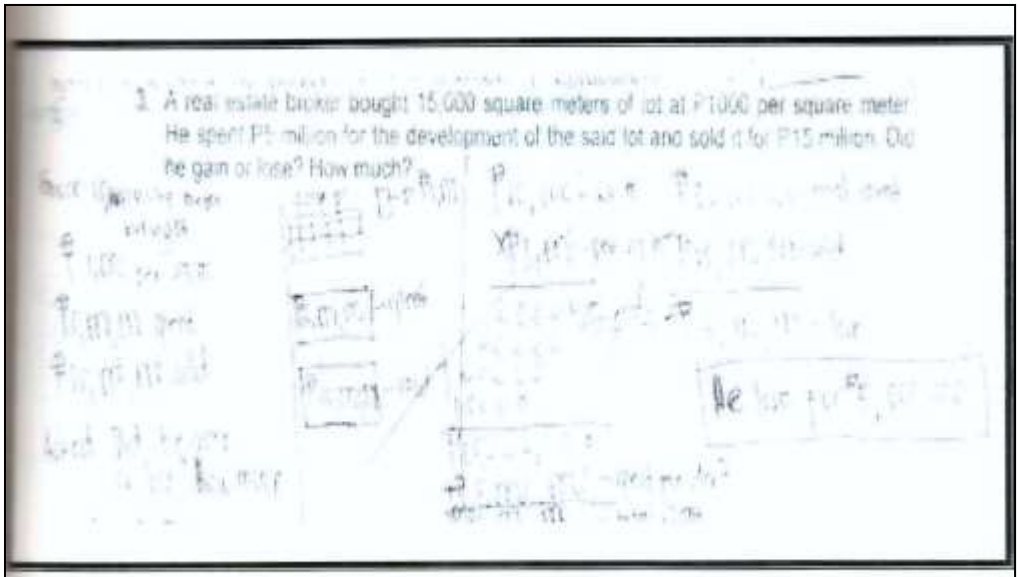

Plate 5. *Strategy C: Drawing of Diagrams/Tables*

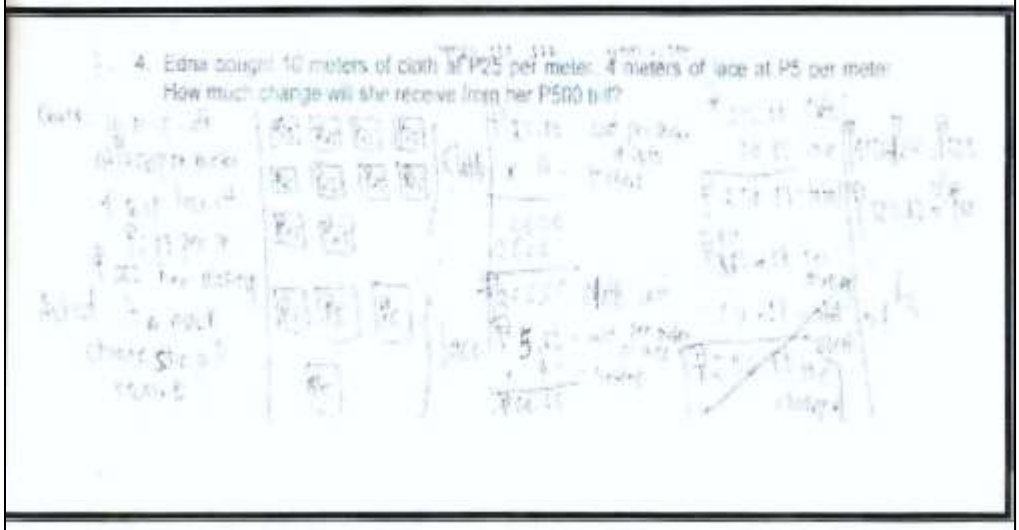

Plate 6. *Strategy C: Drawing of Diagrams/Tables*

Table 9

Distribution of Students in Terms of Strategies

Strategy	Frequency (f)	Percentage(%)
A. Identifying the Target Goal	73	54.89
B. Identifying the Key Information	27	20.30
C. Drawing of Diagrams and Tables	33	24.81
Total	133	100.00

As shown in Table 9, seventy three (73) or 54.98 percent of the respondents used strategy A, while twenty seven (27) or 20.30 percent utilized strategy B and thirty three (33) or 24.81 percent used strategy C.

As reflected in Table 9, majority of the respondents employed strategy A because of the fact that this type of strategy was the one introduce by the teacher in the classroom during the discussion of problem solving making the student to recall and apply it more easily.

5.6 Common Errors in Solving Basic Mathematics Problems

On the next page are sample works of students which show their common errors. These errors which are commonly done by students and are often times overlooked by the teacher.

Common Error A: Unable to Derive and Identify the Right Working Equation: Considered as the Waterloo of students in solving problems, the inability to derive and identifying the right working equation ranked first among the common errors of the respondents in solving problems. It has been a common fact that deriving and identifying the right working equation should be a prerequisite skill in order for an individual to be successful in dealing with problem solving.

Sample common error A on the next page revealed that students did not know what they were doing. They even did not know the formula to use so that they will arrive at a correct answer. This clearly manifested the lack of direction of their solution on what was really being required by the problem they were solving.

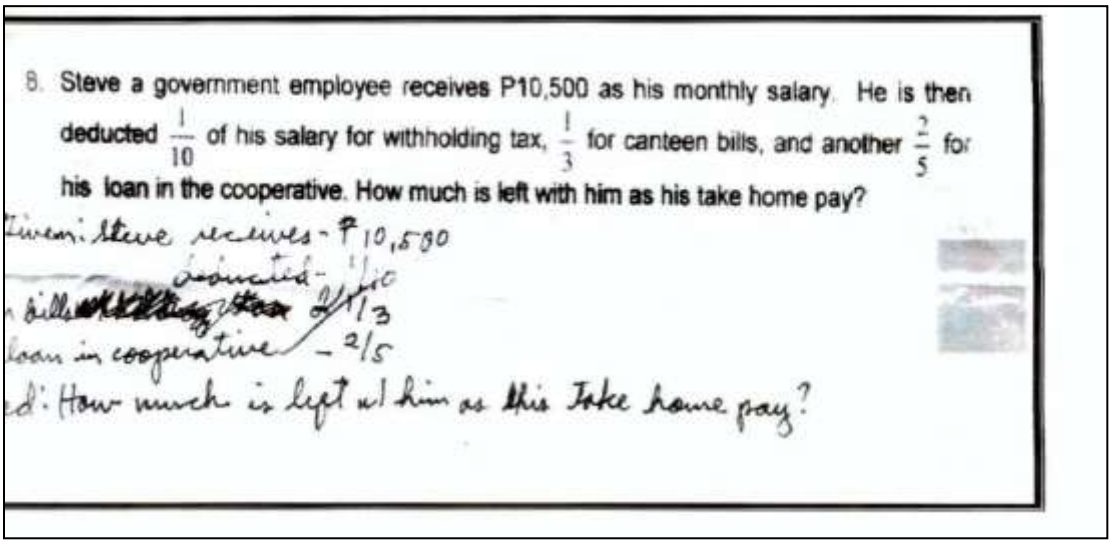

Plate 7. Common Error A: Unable to Derive and Identify the Right Working Equation

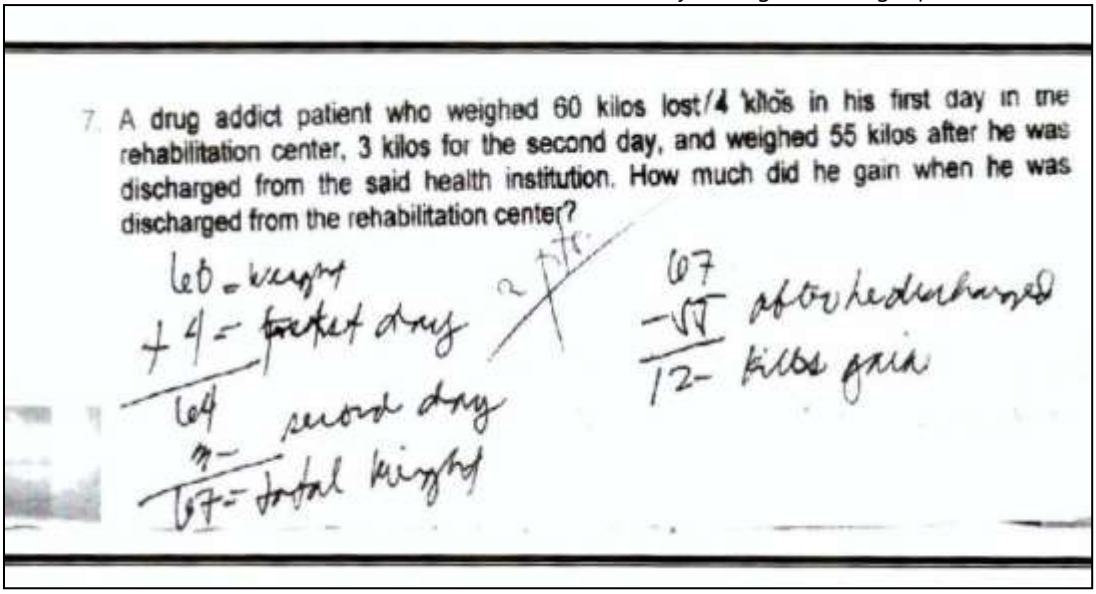

Plate 8. Common Error A: Unable to Derive and Identify the Right Working Equation

Common Error B: Unable to Label the Final Answer. Another common error encountered by the respondents in this study was forgetting to label the final answers. This may be caused by their being careless or this may already be a part of their habit since some of their previous teachers tolerated their mistakes consequently transforming it into a habit so by the time they will be exposed to problem solving they will still repeat the said error.

As what common error B has shown that the students were solving the problem in the proper way which consequently leads them to the correct answer but it is sad to note that they forgot to label their answer with the proper unit which made them wrong. This common error is also present during mathematics contests where contestants fail to label their answer.

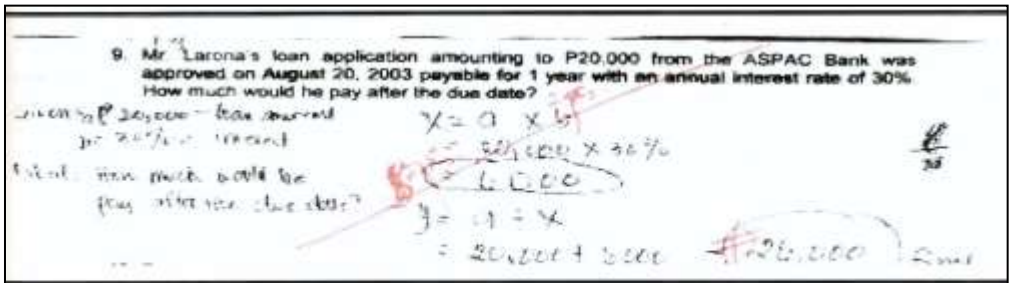

Plate 9. *Common Error B: Unable to Label the final answer or Write the Units*

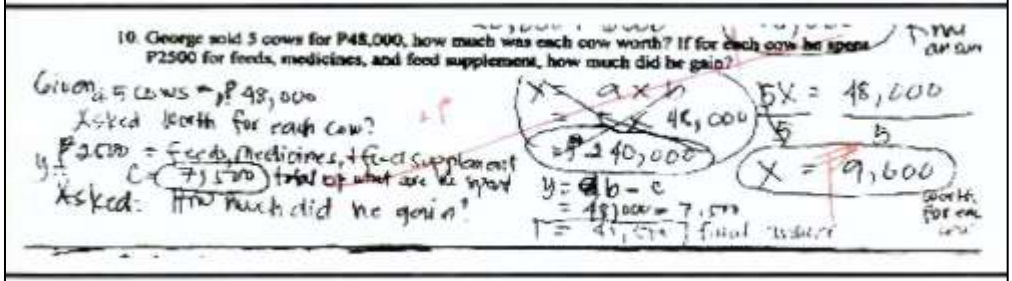

Plate 10. *Common Error B: Unable to Label the final answer or Write the Units*

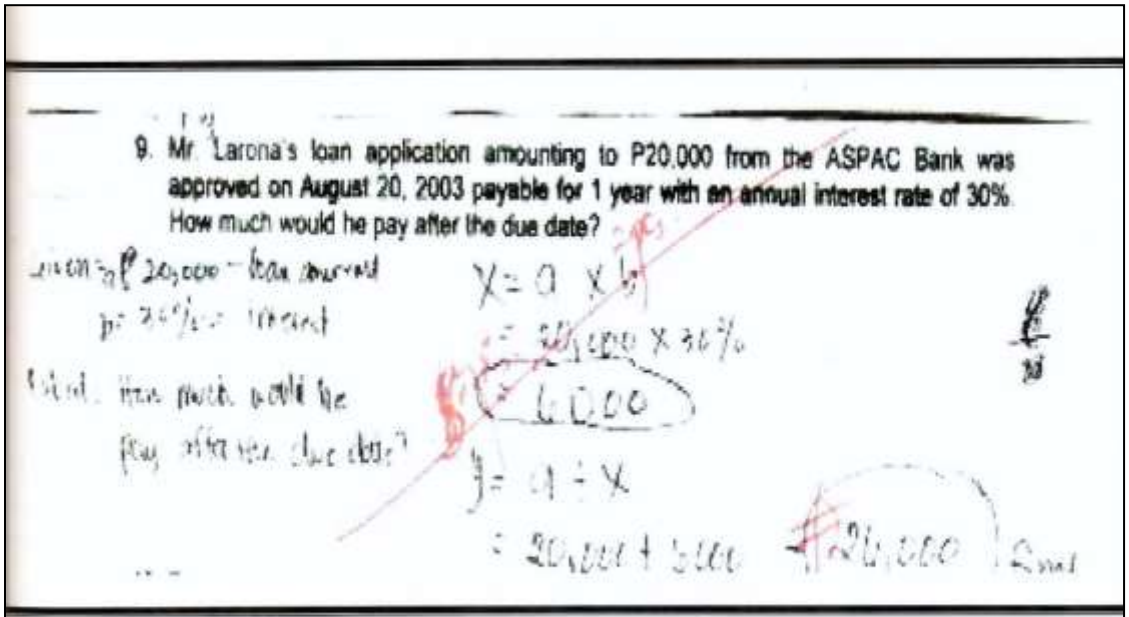

Plate 9. *Common Error B: Unable to Label the final answer or Write the Units*

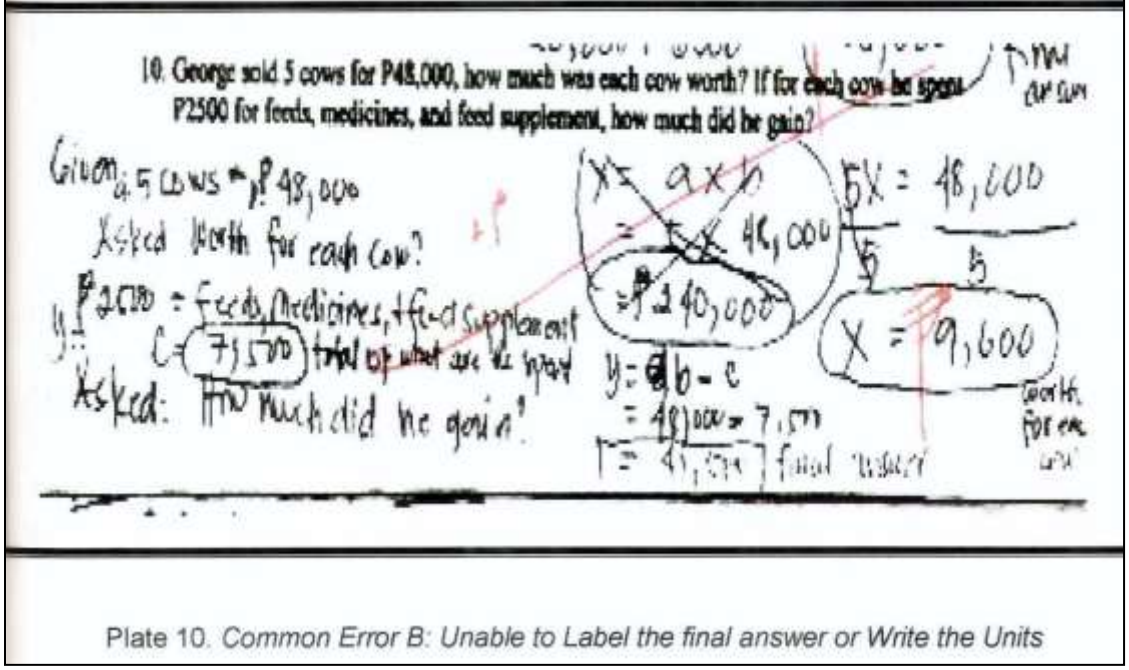

Plate 10. *Common Error B: Unable to Label the final answer or Write the Units*

Common Error C: Adding and Subtracting Fractions without Using the Least Common Denominator. The third error encountered by the respondents in this study is the incorrect way of adding and subtracting fractions, specifically when it comes to fractions with different denominators or dissimilar fractions. In this particular error, the respondents are adding both numerator and denominator.

Sample common error C revealed the lack of knowledge of the respondents in adding fractions with the use of the least common denominator. Based on the samples below, students were adding both numerator and denominator of the fraction being added that consequently lead them to a wrong answer.

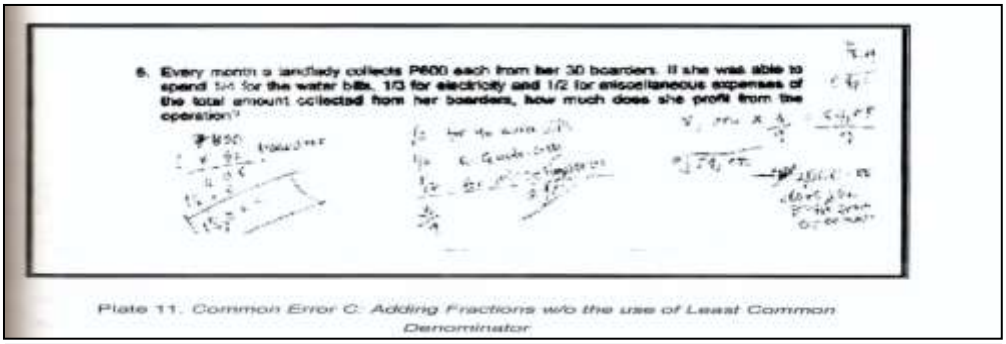

Plate 11. *Common Error C: Adding Fractions w/o the use of Least Common Denominator*

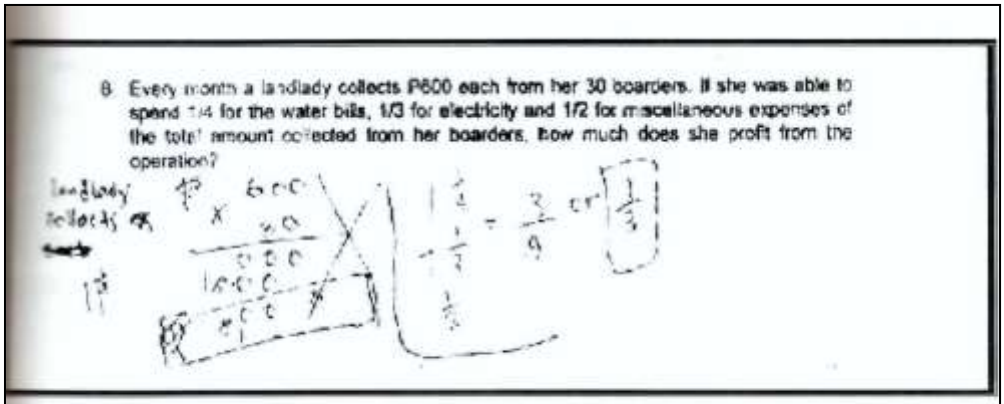

Plate 12. *Common Error C: Adding Fractions w/o the Use of Least Common Denominator*

Table 10

Distribution of the Students in Terms of Common Errors

Common Error	Frequency (f)	Percentage(%)
A. Unable to Identify/Derive the Right Working Equation	65	48.87
B. Unable to Label the Final Answer	25	18.80
C. Adding Fractions w/o Using LCD	43	32.33
Total	133	100.00

As shown in Table 10, sixty five (65) or 48.87 percent of the respondents committed Error A, twenty five (25) or 18.80 percent committed Error B and forty three (43) or 32.33 percent committed Error C.

As reflected in Table 10, the majority of the respondents was inclined to commit error A than the rest of the identified errors which was also supported based on what the researcher had observed and experienced when he was handling the said subject in the department.

5.6.1 Relationship Between the Students' Achievement in Basic Mathematics and the Primary Variables

The primary variables are the following: achievement in High School Mathematics, attitude towards the subject, and attitude towards the teacher. Each of this was correlated to the respondents achievement in Basic Mathematics.

Table 11

Relationship Between Achievement in Basic Mathematics and the Primary Variables

Between Achievement in Basic Mathematics and	Mean	SD	R	Interpretation
Achievement in HS Mathematics	2.51	0.35	0.47	Low Positive
Attitude Towards Mathematics	2.80	0.33	-0.15	Little Negative
Attitude Towards the Teacher	3.00	0.38	-0.01	Little Negative

As shown in Table 11, the relationship between the Achievement in Basic Mathematics and the primary variables namely: 1) achievement in HS Mathematics is 0.47 which is Low Positive Correlation, 2) attitude towards Mathematics is -0.15, Little Negative Correlation, and 3) attitude towards the teacher is -0.01 which is also Little Negative Correlation.

Table 12
t – test Data for the Test of Significance and Obtained Pearson r Value

Between Achievement in Basic Mathematics and	*r*	*t* computed value	*df*	*t* critical value at 0.05	Significance
Achievement in HS Mathematics	0.47	6.095	∞	1.960	Significant
Attitude Towards Mathematics	-0.15	1.750	∞	1.960	Not Significant
Attitude Towards the Teacher	-0.01	0.115	∞	1.960	Not Significant

5.7 Relationship Between Students' Achievement in Basic Mathematics and Achievement in High School Mathematics

It was hypothesized that there is no significant relationship between students' achievement in HS Mathematics and achievement in Basic Mathematics. The t – test was used to test the significance of the obtained Pearson r value at 0.05 level of significance. Since the computed t – value of 6.095 is very much greater than the table value of 1.960, therefore the null hypothesis must be rejected. This means that there is a significant relationship between the students' achievement in HS Mathematics and their achievement in Basic Mathematics. This finding also revealed a substantial correlational link between the previous learning in Mathematics and achievement is in consonance with the observation that the good standing of the students' previous learning to a good achievement in Basic Mathematics. This is supported by Begel (1979 as quoted by Atibula,1996) who stated that the best measure of success in Algebra are the students' previous success in Mathematics courses, as measured by their grades in Mathematics courses and affirmed by Razonable (1998) who also found out that there was a significant relationship between the students' previous learning in Mathematics and in their achievement in Analytic Geometry (DeBellis & Goldin, 2006) (Knuth & Alibali, 2005).

6. Conclusion

This study sought to determine the different strategies and common errors in solving word problems in Basic Mathematics among Freshman University of Cebu BEED students.

Based on the findings of the study, it can be concluded that the students' Achievement in HS Mathematics is an influential factor in the students' achievement in Basic Mathematics. The other primary variables like attitude towards the teacher do not have significant effects to one's learning in Basic Mathematics. There were three strategies which are commonly employed by the respondents in this study in solving Basic Mathematics problems: a) identifying the target goal; b) identifying the key information; and c) drawing diagrams and tables. The three prominent errors encountered by the respondents in solving Basic Mathematics problems; a) unable to derive and identify the right working equation, b) unable to label the final answer with the right unit. And adding and subtracting fractions without the least common denominators.

The study's findings are constrained to BEED students enrolled in the College of Teacher Education at the University of Cebu-Main. Therefore, the generalization of results may vary based on the specific context of the respondents.

The study's findings suggest potential topics for further research, including factors influencing students in making common errors when solving basic mathematics concepts, the readiness of students to undertake basic mathematics courses, and the correlation between students' high school graduation and their preparedness for college-level mathematics courses.

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