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The Most Essential Learning Competencies in Probability of the Grade 10 Learners

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ABSTRACT

This study aimed to formulate a validated strategic intervention material to improve the solving skills of the Grade 10 students of Nagbukel District, school year 2022-2023. Specifically, it determined the profile of the respondent, level of attainment of the learning competencies in probability, mastery of the competencies, significant relationship between the profile and attainment of the competencies in probability of grade 10 students, instructional material is formulated to increase the level of performance of the student in probability, and level of validity of the strategic intervention material.

Descriptive research design employing correlational and developmental approaches. The result revealed that 3 competencies shown as attained and 5 classified as moderately attained and slightly attained. There are 5 learning competencies determined as least mastered and needed to provide interventions. It is shown that the educational attainment of the father is significantly related. The level of validity of the crafted strategic intervention material is very valid.

It is recommended that gadgets must be used for educational purposes and parents must give their full support to their children regardless of their educational attainment; teachers utilized instructional strategies to enhance the learning capabilities of the students; least mastered competencies must provide interventions to improve solving skill in probability; parents should be involved to the academic needs of their children; strategic intervention material should be utilized to enhance their performance in probability; and related studies may be conducted to validate the result of the current study.

KEYWORDS: Strategic Intervention Material, learning competency, probability

1. INTRODUCTION

Mathematics has a vital role in our day-to-day lives, and that's why it is one of the core components of education in all countries. The Department of Education crafted the paradigm to ensure the holistic development of every learner. According to Mohamed & Waheed (2011), students' performance in mathematics is consistently given attention in different countries because it is regarded as the main subject, which is significant for the growth and development of the nation. Mathematics students' knowledge and skills are crucial in their daily lives to overcome any challenges they may encounter. This underperformance in mathematics is not just a problem in a few countries but has become the preoccupation of every nation in recent years (OECD, 2003). The Philippines is one of those countries that has concerns about mathematics achievement, specifically in high school. According to the result of Trends in International Mathematics and Science Study (TIMSS 2019) that the Philippines got the lowest ranked out of 58 participating countries, the Philippines only scored 297 points. This situation needs attention on how to improve the mathematical skills of the learners.

In mathematics, the probability is one of the competences that learners must master. This is because their knowledge of probability can help people in reading a newspaper, evaluating the information, analyzing the accuracy and probability of the event, and making the prediction or decision based on the information (Dreir 2000). The probability of an event dominates daily life activities such as controlling the flow of traffic through the highway system, predicting the number of people of all ages involved in an accident and estimating the spread of rumours (Batanero, Chernoff, Engel, Lee, & Sánchez, 2016).

Learning the concept of probability and solving the word problem of probability presents a challenge to the students. This is because students need to master the concept of probability, problem solving process and understand the probability of problem simultaneously when solving probability word problem (Beitzel & Staley, 2015; Galavotti, 2015; Usry, Rosli, & Maat, 2016). In addition, Cortel and Zahner 2007, As some experts point out that probability problem solving can be very difficult for students. The natural misconceptions about the probabilistic concepts and the problem of using the word or probability term in mathematics also become difficult for many students. This is possible because to solve the problem students as problem solvers must think abstractly about the situation presented and then represent the situation using mathematical concepts. Also, probabilistic problem solving requires a combination of procedural, conceptual, and real-world knowledge.

Kandeel's 2019 also added that students face many academic difficulties in learning probability, and this is due to the weakness of their mathematical background. These academic difficulties are concentrated in the lessons of permutation, combination, probability, and random variable. The results indicated that all the academic difficulties surveyed by instructors occurred at the "high" or "very high" level and that no difficulty was located at the medium or low levels. His study agreed with Garfield and Ahlgren 1998 which stated that a large proportion of students, even in college, do not understand many of the basic statistical concepts they have studied and part of this is inadequacies in prerequisite mathematics skills and abstract reasoning. The study also supported the findings of Arum et al. 2017 which showed that students have difficulties in solving the probabilistic problem and can be divided into three categories: understanding the probabilistic problem, choosing, and using appropriate strategies for solving the problem, and the computational process in solving the problem. There must be a reason why students still have a problem in solving probability.

Thus, this study has been conducted by the researcher to find out the possible factor that affects the probability solving skills of Grade 10 student. The researcher also aims to know the significant relationship between the student profile and the mathematics performance. The findings of this study may be used as a benchmark for the researcher to develop enhancement plan for mathematics performance.

2. RESEARCH METHODOLOGY

This study made used of descriptive research design employing correlational and developmental approaches. The descriptive method was used to describe the profile of the respondents and the level of attainment of learning competency in probability. On the other hand, the correlation design is used to determine the association of the profile and their performance.

Furthermore, developmental research involves the production of knowledge, the goal is to improve instructional design, development, and evaluation. In this study, it was used in the production of Strategic Intervention Materials in Probability.

2.1 Population and Locale

The respondents of this study were the students from the two secondary schools of Nagbukel District,

Nagbukel National High School and Bantugo-Mission Integrated School during the School Year 2022-2023. Total enumeration was used in this study. In total, there are seventy-five (75) respondents in this study.

2.2 Research Instrument and Procedure

To collect the necessary information to complete this study, the following gathering instrument were used: First, a survey questionnaire was used as the main data gathering instrument. It gathered the profile of respondents in terms of age, educational attainment of parents, occupation of parents, estimated monthly allowance, availability of gadgets at home for learning, and number of references at home. Second, a 65-item researcher made test was used to determine the level of attainment of the different learning competencies. The test covers topics on Probability. The teacher made test was content validated by 5 experts in Mathematics with a computed mean of 4.84 which means that the instrument is valid. The test items were pilot tested to a group of Grade 10 in Ilocos Sur Polytechnic State College Sta. Maria Campus, Laboratory High School to determine its reliability using the Cronbach Alpha. The computed reliability value of 0.72 means that the instrument is reliable to gather the needed data.

The researcher wrote a letter asking permission from the Superintendent of the Schools Division of Ilocos Sur to administer the research instrument validation and conduct the actual survey via questionnaire and achievement test to the respondents. The researcher personally asked permission from the Principal of Nagbukel National High School and Head Teacher of Bantugo-Mission Integrated School. The questionnaires and performance tests were personally distributed to the respondents by the researcher.

2.3 Statistical Analysis

The data gathered were presented, analyzed, and interpreted using the following: Frequency count and percentage was employed to describe the profile of the respondents. In determine least mastered and mastered competency, the formula will be used, level of competency = $\frac{\textit{No.of respondents got the correct answer}}{\textit{total number of respondents}}$. The mean and standard deviation were utilized to describe the level of attainment of learning competency in probability of the students. The spearman-rank correlation was used to determine the significant relationship between the attainment of the competencies in probability and profile.

3 RESULT AND DISCUSSION

Table 1 Demographic profile of the respondents

Profile	F	Percentage %
Age		
15	24	**32.00**
16	47	62.67
17	3	4.00
18	1	1.33
Total	**75**	**100**
Educational Attainment of the Father		
Elementary Level	5	6.67
Elementary Graduate	4	5.33
High School Level	11	14.67
High School Graduate	37	49.33

Tech Voc Graduate	1	1.33
College Level	4	5.33
College Graduate	11	14.67
Post College Graduate	0	0
Total	**75**	**100**
Educational Attainment of the Mother		
Elementary Level	1	1.33
Elementary Graduate	5	6.67
High School Level	4	5.33
High School Graduate	37	49.33
Tech Voc Graduate	0	0
College Level	11	14.67
College Graduate	17	22.67
Post College Graduate	0	0
Total	**75**	**100**
Father's Occupation		
Regular	5	6.67
Probationary	1	1.33
Temporary	6	8.00
Project	2	2.67
Seasonal	0	0.00
Casual	1	1.33
Self Employed	57	76.00
Others	3	4.00
Total	75	**100.00**
Mother's Occupation		
Regular	2	2.67
Probationary	2	2.67
Temporary	19	25.33
Project	0	0.00
Seasonal	0	0.00
Casual	0	0.00
Self Employed	48	64
Others	3	4.00
Total	**75**	**100.00**
Estimated Monthly Allowance		
500-999	30	40.00
1000-1499	16	21.33
1500-1999	14	18.67
2000-2499	2	2.67
2500-above	13	17.33
Total	**75**	**100.00**
Availability of Device at Home for Learning		

Cable TV	23	19.33
Non Cable TV	5	4.20
Desktop	1	0.84
Cellphone	72	60.50
Table	4	3.56
Laptop	12	10.08
others	1	0.84
None	1	0.84
Total	**119**	**100.00**
Number of Relevant References at Home		
0-1	44	58.67
2-3	5	6.67
4-5	17	22.67
6-7	7	9.33
8-9	2	2.67
Total	**75**	**100.00**

Based on the table 1, most of the respondents were 16 years old with a frequency 47 or 62.67%. It is also found out that both parent's of the respondents were high school graduate with a frequency of 47 or 62.67%. Both parents were classified as self-employed with a frequency of 57 and 48 or 76% or 64%. 40% of the respondents have monthly allowance ranging from 500-999 pesos. Most of them only used phones as their available device at home and only 0-1 relevant references available with a frequency of 44 or 58.67%.

Table 2 shows the level of Attainment of Learning Competency on Illustrating the permutation of objects.

Competency/Item	NV	DR
Illustrating the permutation of objects.		
1. What is the sum of the expression 7! + 3!?	0.69	A
2. Which of the following values of P in the expression $P_{(6,6)}$.	0.68	A
3. Evaluate: 1! + 2! + 4!	0.6	MA
4. What is P(8,5)?	0.57	MA
5. Find the number of permutations of the letters of the word MOMMY.	0.71	A
6. How many ways can the 7 persons be seated in a circular table?	0.65	A
Mean	0.65	A
SD	0.48	

Legend: MA – moderately attained A - attained

The table 2 revealed that Item no. 4 and 5 had the least numerical value of 0.6 and 0.57 with a descriptive rating of moderately attained. Item 5 had the highest numerical value with 0.71 described as attained, followed by item 1 with 0.69 and described as attained. The overall mean rating is 0.65 is described as attained. The computed mean implies that the competency level of the students is on the attainability level. The result of this study affirms the finding of Kapolyo and Leonard (2019) that students improve their academic performance using problem-based learning in permutation and combination. Maliga (2018) also

proved that supplemental learning materials exposed to experimental group really motivated the Grade 10 students to solve math problems and further improved their math achievement.

Table 3 Level of attainment of learning competency on solving problems involving permutation

Solving problems involving permutation	NV	DR
7. How many different three-letter patterns can be formed using the letters V, W, and X, if a letter cannot be used more than once?	0.63	A
8. How many different 3-digit numbers can be formed from the digits 1, 3, 4, 6, 7, 9 if repetition of digits is not allowed?	0.28	FA
9. A multiple-choice test contains five questions, and each question has four options. In how many ways can the five questions be answered?	0.25	FA
10. How many ways can the letters from the word FLEA be arranged such that each "word" starts with a consonant and ends with a vowel?	0.52	MA
11. Twenty students join a contest in the school. The contest offers first, second and third prize. How many different combinations of 1st, 2nd, and 3rd place winners can there be?	0.26	FA
12. How many three-digit numbers can be formed using the digits 5, 7, 8 and 2 if the digits cannot be repeated.	0.52	MA
13. How many three-digit numbers can be formed using the digits 5, 7, 8 and 2 if repetition of digits is not allowed, and the number is less than 700?	0.44	MA
14. How many three-digit numbers can be formed using the digits 5, 7, 8 and 2 if 5 is the first digit, 2 is the second digit, and repetition of digits is allowed?	0.26	FA
15. Rose is planting 11 colored flowers in a line. In how many ways can she plant 4 red flowers, 5 yellow flowers, and 2 purple flowers?	0.45	MA
16. Bobby has 5 textbooks on his shelf. If math must always be in the middle, how many ways can he arrange the books?	0.56	MA
Mean SD	0.42 0.49	MA

Legend: FA – fairly attained MA – moderately attained A - attained

The table 3 revealed that item 7 got the highest numerical value of 0.63 with a descriptive rating of attained, followed by item 16 with 0.56 described as moderately attained. Item 9 has the least with 0.25 described as fairly attained. The mean of attainment of the competency is 0.42 with a descriptive rating of moderately attained. This result implies that the level of attainment under this competency is below the attainability level. This result suggests a need to enhance the students' knowledge and skills in this competency.

Table 4 Level of attainment of learning competency on illustrating the combination of objects

Illustrating the combination of objects.	NV	DR
17. The value of C(8,2) is _____.	0.73	A
18. The product of (7C4) and (4C4) is _____.	0.6	MA
19. The product of (6C3) and (7C1) is _____.	0.65	A
20. If C(n, r) = 35, which of the following are possible values of n and r?	0.69	A
21. C(12, r) = 792, which of the following is a possible value of r?	0.76	A

22. How many diagonals does a pentagon have?	0.59	MA
23. How many diagonals can be drawn in a 9-sided polygon?	0.61	A
Mean SD	0.66 0.47	A

Legend: MA – moderately attained A - attained

It can be seen in table 4 that most of the items described as attained. Item 7 got the highest numerical value of 0.76 with a descriptive rating of attained and item 22 had the least numerical value with 0.59 with a descriptive rating of moderately attained. The mean of the attainment of the competency is 0.66 with a descriptive rating of attained. This implies that the level of attainment of competency is on the attainability level.

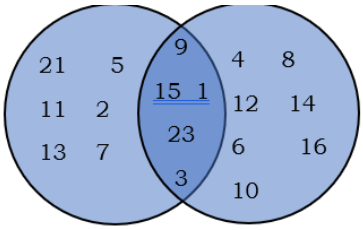
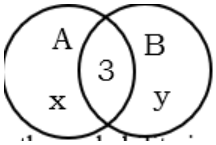
Table 5 Level of attainment of learning competency on solving problems involving combinations

Solving problems involving combinations.	**NV**	**DR**
24. How many choices of 6 pocketbooks to read can be made from a set of nine pocketbooks?	0.73	A
25. In a box, there are 5 black pens, 3 white pens and 4 red pens. In how many ways can 2 black pens, 2 white pens and 2 red pens be chosen?	0.69	A
26. There are 7 dots randomly placed on a circle, how many triangles can be formed using the dots as vertices?	0.51	MA
27. In how many ways can a committee of 7 students be chosen from 9 juniors and 9 seniors if there must be 4 seniors in the committee?	0.52	MA
28. Jane wants to solve a system of equations through elimination by combining any two equations. The number of equations she has is equal to the number of variables. She realizes that she has 10 possible ways to start her solution. How many equations does she have?	0.63	A
29. A caterer offers 3 kinds of soup, 7 kinds of main dish, 4 kinds of vegetable dish, and 4 kinds of dessert. In how many possible ways can a caterer form a meal consisting of 1 soup, 2 main dishes, 1 vegetable dish, and 2 desserts?	0.6	MA
30. A box contains 6 red balls and 4 blue balls. Three balls are drawn at random. In how many ways ca be 3 balls be drawn from 10 balls if two balls are red and 1 ball is blue?	0.6	MA
31. A group of 6 women and 9 men will form four-person committees. How many committees are possible if it must consist of 2 men and 2 women?	0.72	A
32. A group of 6 women and 9 men must select a six-person committee. How many committees are possible if each committee must be equal number of men and women?	0.56	MA
33. A group of 6 women and 9 men must select a six-person committee. How many committees are possible if each committee must no women?	0.63	A
Mean SD	0.62 0.48	A

Legend: MA – moderately attained A - attained

The table 5 shows that items 24 and 31 had the highest numeric value of 0.73 and 0.72 with a descriptive rating of attained. Items 26 and 27 got the least with 0.51 and 0.52 described as moderately attained. It shows in the table that the mean is 0.62 with a descriptive rating as attained. The computed mean implies that the student level of attainment of competency is on the acceptability level.

Table 6 Level of Attainment of Learning Competency on Illustrating Events, and Union and Intersection of Events

Illustrating events, and union and intersection of events.	NV	DR
34. A die is tossed once. Which of the following shows sample space?	0.28	FA
35. A die is tossed once. If A is the event that an even number comes out. Which of the following shows the element of A?	0.35	FA
36. A 5-section spinner marked 1, 2, 3, 4, and 5 is spun once and a coin is tossed once. A is the event of spinning a 4 and B is the event of getting a tail. Which of the following shows A ∩ B of an event?	0.45	MA
37. A 5-section spinner marked 1, 2, 3, 4, and 5 is spun once and a coin is tossed once. A is the event of spinning a 4 and B is the event of getting a tail. Which of the following shows A ∩ B of an event?	0.43	MA
38. A 3-section spinner marked red, green, and blue is spun once and a coin is tossed one. A is the event of spinning a red and B is the event of getting a head. Which of the following shows A U B of an event?	0.37	FA
39. Which of the following is the union of events A and B? 	0.35	FA
40. The Venn diagram on the right shows the number of elements in set A and B. If n(A ∪ B) = 20, n(A ∩ B) = 3, and n(B) = 12, find the values of x and y. 	0.45	MA
Mean SD	0.38 0.49	FA

Legend: FA – fairly attained MA – moderately attained

It can be seen in the table 6 that most of the items are described as slightly attained. Item 34 got the least numerical value of 0.28 with a descriptive rating of fairly attained. Items 36 and 40 had the highest numerical value 0.45 described as moderately attained. The computed mean is 0.38 described as slightly attained. This implies that the student's level of attainment of the competency needs to be enhanced to increase the attainability level of the competency.

Table 7 Level of attainment of learning competency on illustrating and find the probability of a union of two events

Illustrating and find the probability of a union of two events.	NV	DR
41. When choosing an "Ace" or a "King" from a standard deck of cards, the probability is _____.	0.32	FA
42. In an English alphabet, what is the probability of getting a vowel letter when you'll be asked to pick one?	0.33	FA
43. What is the probability of picking a heart card or a face cards?	0.35	FA
44. The sum of the probability obtained in all possible outcomes when throwing a die is equal to ____.	0.47	MA
45. If a member is randomly chosen, what is the probability that a member participates in athletics or band?	0.29	FA
46. If a member is randomly chosen, what is the probability that a member participates in band or choir?	0.24	FA
47. Find the probability of choosing the letter M or the letter E from the word "MATHEMATICS".	0.43	MA
48. In a 1,250 – ticket draw for an educational prize, Charm Brilliant's name was written on 77 tickets. What is the probability that he would win?	0.33	FA
Mean SD	0.33 0.48	FA

Legend: FA – fairly attained MA – moderately attained

It can be seen that most of the items are described as fairly attained. Item 46 got the least numerical value of 0.29 with a descriptive rating of fairly attained while item 44 got the highest numerical value of 0.47 described as moderately attained. The computed mean is 0.33 with a descriptive rating of fairly attained. This implies that the result is below the acceptability level so there is a need to enhance the performance of the students to alleviate the attainability level.

Table 8 Level of attainment of learning competency on illustrating mutually exclusive events

Illustrating mutually exclusive events.	NV	DR
49. Two fair dice are thrown. What is the probability that the first die shows 5 or the second die shows 6?	0.35	FA
50. One die is tossed. What is the probability that it shows a 3 or a 5?	0.27	FA
51. A card is drawn at random from a deck of cards. Find the probability of drawing A red ace or a heart jack.	0.36	FA
52. A card is drawn at random from a deck of cards. Find the probability of drawing A 2, 3, or 4.	0.35	FA
53. A box contains 4 red balls, 5 green balls, and 3 blue balls. Helen draw one ball at random. Find the probability of getting either green or red.	0.37	FA

54. A box contains 4 red balls, 5 green balls, and 3 blue balls. Helen draw one ball at random. Find the probability of getting either red or blue.	0.35	FA
55. A box contains 4 red balls, 5 green balls, and 3 blue balls. Helen draw one ball at random. Find the probability of getting green or blue.	0.35	FA
Mean SD	0.33 0.47	FA

Legend: FA – slightly attained

It shows that all the items are described slightly attained. Item 50 got the least numerical value of 0.27, and item 53 got the highest numerical value of 0.37. The computed mean is 0.33, described as fairly attained. This implies that there is need to enhance the performance of the students to increase the attainability level of this competency.

Table 9 Level of attainment of learning competency on solving problems involving probability

Solving problems involving probability.	**NV**	**DR**
56. A die is rolled. What is the probability of rolling an even number or a multiple of 3?	0.27	FA
57. A bag contains 5 red marbles, 7 blue marbles, and 10 green marbles. One marble is drawn at random. What is the probability that it will be red or not blue?	0.32	FA
58. If I throw 2 standard 5-sided dice, what is the probability that the sum of their top faces equals to 10? Assume both throws are independent to each other.	0.25	FA
59. A box of candies contains 5 yema candies, 8 sampaloc candies, and 10 bucayo candies. Jenevive randomly chooses a candy, eats it, and then randomly chooses another candy. What is the probability that Jenevive chose a yema candy, and then a sampaloc candy?	0.33	FA
60. In a group of 100 sports car buyers, 40 bought alarm systems, 30 purchased bucket seats, and 20 purchased an alarm system and bucket seats. If a car buyer chosen at random bought an alarm system, what is the probability they also bought bucket seats?	0.37	FA
61. Two cards are chosen at random from a deck of 52 cards without replacement. What is the probability that the first card is a jack, and the second card is a ten?	0.32	FA
62. A school survey found that 7 out of 30 students walk to school. If four students are selected at random without replacement, what is the probability that all four walks to school?	0.29	FA
63. Roy bought four different batteries. Of these four, one is defective. Roy randomly selected two batteries to be used on that particular day. Find the probability that the second battery selected is not defective, given that the first was not defective.	0.29	FA

64. In a group of 100 sports car buyers, 40 bought alarm systems, 30 purchased bucket seats, and 20 purchased an alarm system and bucket seats. If a car buyer chosen at random bought an alarm system, what is the probability they also bought bucket seats?	0.41	MA
65. A box contains four green balls, six red balls, and five pink balls. If one marble is drawn at random find P(green/not pink).	0.37	FA
Mean SD	0.32 0.47	FA

Legend: FA – slightly attained

It shows that item 58 got the lowest numerical value of 0.25 with a descriptive rating of fairly attained. Item 64 got the highest numerical value of 0.41, described as moderately attained. The computed mean of 0.32 is described as fairly attained. This result indicates that there is a need to enhance the performance of the students to increase the attainability level of the competency.

Table 10 Shows the summary of the level of attainment of the learning competencies

Competency	Mean	DR
1. Illustrating the permutation of objects.	0.65	Attained
2. Solving problems involving permutations.	0.42	Moderately Attained
3. Illustrating the combination of objects.	0.66	Attained
4. Solving problems involving combinations.	0.62	Attained
5. Illustrating events, and union and intersection of events.	0.38	Fairly Attained
6. Illustrating and find the probability of a union of two events.	0.33	Fairly Attained
7. Illustrating mutually exclusive events.	0.33	Fairly Attained
8. Solving problems involving probability.	0.32	Fairly Attained
Overall Mean	0.46	Moderately Attained

Legend: 0.61 – 0.79 Attained 0.41 – 0.60 Moderately Attained 0.21 – 0.40 Fairly Attained

Table 10 shows the level of attainment of learning competency in probability. It is shown that learning competencies 1, 3, and 4 are described as Attained. Item 2 is described as Moderately Attained, while learning competencies 5, 6, 7, and 8 are described as Fairly Attained. The overall mean is 0.46 described as Moderately Attained. This result indicates that there are 5 learning competencies that needs to enhance the performance of the student to increase the level of attainability of the competency.

Table 11 Shows the Mastered and Least Mastered Competencies

Competency	Mean	DR
1. Illustrating the permutation of objects.	0.65	Mastered
2. Solving problems involving permutations.	0.42	Least Mastered
3. Illustrating the combination of objects.	0.66	Mastered
4. Solving problems involving combinations.	0.62	Mastered
5. Illustrating events, and union and intersection of events.	0.38	Least Mastered

6. Illustrating and find the probability of a union of two events.	0.33	Least mastered
7. Illustrating mutually exclusive events.	0.33	Least Mastered
8. Solving problems involving probability.	0.32	Least Mastered

Legend: 0.00 – 0.60 least mastered 0.61 – 1.00 mastered

Table 11 shows the mastered and least mastered competency in probability. It is shown that there are five (5) competencies identified as least mastered including solving problems involving permutation, illustrating events, and union and intersection of events, illustrating and find the probability of a union of two events, illustrating mutually exclusive events, and solving problems involving probability. These learning competencies scored a mean ranging from 0.00 to 0.60. This indicates that the students have struggled with the basic concepts that is why it is difficult to grasp the concept. The result implies that there is a need to provide interventions that should target the identified least mastered competency.

Table 12 Correlation between the profile and attainment of the competencies in probability

Profile	Computed r	p-value	Interpretation
Age	-0.077	0.513	Ns
Highest Educational Attainment of Father	0.244*	0.035	S
Highest Educational Attainment of Mother	0.206	0.077	Ns
Occupation of Father	-0.045	0.700	Ns
Occupation of Mother	0.037	0.703	Ns
Estimated Monthly Allowance	0.106	0.753	Ns
Availability of Device at Home			
Cable TV	0.106	0.367	Ns
Non-cable TV	0.027	0.821	Ns
Desktop	0.001	0.996	Ns
Cellphone	-0.019	0.873	Ns
Tablet	0.163	0.164	Ns
Laptop	0.084	0.475	Ns
No. of relevant references	0.119	0.307	Ns

Legend: * significant at 0.05 level ns – not significant s - significant

The relationship between the profile and the mathematics performance of the students was also analyzed. The result of the analysis is shown in table 12. It can be seen from the result that the highest educational attainment of the father is significantly related to performance. This means that educational attainment is a great factor that influences the performance of the student.

Table 13 Result of the Validity Level of the Strategic Intervention Material in Probability

Indicators	Mean Rating	Descriptive Rating
1. The learning objectives are simple measurable, attainable, realistic and time bound	4.6	Very Valid

2. The activities organized based on the sequence of the focus skills.	4.4	Very valid
3. The activities assess their understanding of what they have learned and correct errors when appropriate.	4.8	Very valid
4. Monitor their learning and use feedback about their progress.	4.6	Very valid
5. Provide opportunities for students to work independently or in groups to explore answers to their own	4.6	Very valid
Average	4.6	Very valid

Legend: 4.21 – 5.00 Very Valid

Table 13 displays the result of the validation of the strategic intervention materials for grade 10 learners. The table indicates that item 3 indicator garnered the highest mean rating with 4.8 described as very valid and item 2 got the lowest mean rating with 4.4, still considered as very valid. This implies that the developed Strategic Intervention Materials (SIM) is well-created. The overall mean rating is 4.6 as "very valid" which means that the developed Grade 10 SIM (Probability) is a suitable instrument to help the students to improve their performance in Probability.

4. CONCLUSION

Based on the findings, the following statements were concluded.

1. Most of the respondents are the right age for the grade level, whose parents are high school graduates and self-employed, with an estimated allowance of Php 500.00 to Php 999.00, a cellphone being the most common use for learning, and limited relevant learning resources at home.
2. The respondents attained competency along, illustrating the permutation of objects, illustrating the combination, solving problems involving combinations. On the other hand, the competency showed moderately attained on solving problems involving permutations. Furthermore, the competencies showed fairly attained on illustrating events and the union and intersection of events, illustrating and finding the probability of a union of two events, illustrating mutually exclusive events, and solving problems involving probability.
3. The identified least mastered competencies are: solving problems involving permutations, illustrating events and the union and intersection of events, illustrating and finding the probability of a union of two events, illustrating mutually exclusive events, and solving problems involving probability.
4. Age, mother's educational attainment, occupation of the parent, estimated monthly allowance, availability of device at home for learning, and a number of relevant references at home were found not affect the level of attainment of the competency. However, the father's educational attainment showed a significant positive correlation to the level of attainment of the competency.
5. To address the student's needs and improve the level of attainment of the learning competency in probability, a strategic intervention material is created for the competencies identified as least mastered.
6. The researcher-made SIM is evaluated as very valid and reliable, which can be used to improve the proficiency of students in Probability. It consists of 4 SIMs with 5 lessons.

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