

Project Sabak Interventions and Students' Problem Solving Skills in Mathematics

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DOI: 10.26821/IJSHRE.11.5.2023.110410

Abstract- *The study aimed to determine the effectiveness of the project SABAK interventions and Students' Problem Solving Skills in Mathematics in Ichon National High School. There were 120 respondents who underwent the project interventions. The study used qualitative and quantitative research approaches. It involved collection, recording, analysis, interpretation of the data and perceptions and consideration of the respondents' point of view. The interventions had provided positive impact of the school's flagship banner. The study utilized a teacher-made test and Measurement and Evaluation Tool (M&E) to determine the mastery level of the students in problem solving in mathematics. The interventions had a great role in developing students' comprehension level and in problem solving skills. The students have improved their performance in problem solving in mathematics coping the performance standard set by the Department of Education of 75% mean percentage score across all learning areas.*

Keywords: evaluation tool; intervention; students' comprehension; teacher-made test

1.0 Introduction

Project SABAK is a school project banner that helps the students improve their reading comprehension level. This project was conceptualized on school year 2017-2018 by the Continuous Improvement team spearheaded by the school head. It has four interventions that would address the learning preferences of the students. The interventions are Computer-Aided Reading Enhancement Class (CARE-C), Read and Refresh (RARE), Reading using Indigenous Materials (RIM) and Reading while Playing (RP). Under the CARE-C strategy, the learners had interactive reading activities through the use of computers. Read and Refresh as catered in the strategy was truly refreshing for them. They were exposed to reading activities by group and they were served snacks for free. Reading while Playing strategy is a challenging one. The group collaboratively worked together to give correct answers. The learners took turns in reading the text and answered the questions within the allotted time. The group that have more correct answers won. Another strategy is Reading using Indigenous Materials. These materials were brochures, pamphlets, old textbooks, and other displayed information viewed or seen around in school. The students' responses would relate to their personal experiences that challenge them to share their ideas about it.

A meta-analytic review of group comparison design studies evaluating peer-assisted learning (PAL) interventions with elementary school students produced positive effect sizes indicating increases in achievement. PAL interventions were most effective with younger, urban, low-income, and minority students (Rohrbeck, Ginsburg, Fantuzzo, Miller, & Traci (2003). Higher impact sizes were seen for interventions that used interdependent reward contingencies, emotionless evaluation processes, and increased students' autonomy (Legaspi & Borong, 2022). Increasing technology intervention in rural schools is still a herculean task, especially with the lack of adequate infrastructures and limited resources. The study explored the differences in student achievement in mathematics and English between technology and nontechnology schools and established a relationship between teachers' level of technology implementation and student achievement. The convenience sample comprised 2,369 examination scores in mathematics and English of Senior Secondary Level.

Thus, the mere presence of technology seems to have more impact on student grades than the ways in which teachers use it (Bello, 2014). Physical activity is associated with many physical and mental

health benefits, however, many children do not meet the national physical activity guidelines. While schools provide an ideal setting to promote children's physical activity, adding physical activity to the school day can be difficult given time constraints often imposed by competing key learning areas.

Classroom-based physical activity may provide an opportunity to increase school-based physical activity while concurrently improving academic-related outcomes (Watson, et al.,2017). The absence of intensive instruction and intervention to improve reading comprehension, students with mathematics difficulties and inability to understand the gap of knowledge in word problem solving is lag much behind their peers (Jitendra et al., 2013;

Sayeski & Paulsen, 2010). Conservative estimates show that 25% to 35% of students struggle with mathematics knowledge and application skills in general education classrooms, indicating the presence mathematics difficulty (Mazzocco, 2007). Additionally, 5% to 8% of all school age students have such significant deficits that impact their ability to solve computation and application problems that they provide an overview of strategies and resources to support students with, or at-risk in reading comprehension. Teaching math problem solving has been a challenge for many educators, especially in schools (Geary, 2004).

The main source of math instruction material is textbooks given by the district under investigation. Additionally, teaching computation was the strategy utilized to get students ready for later courses on problem solving. The recent introduction of new math standards and the dearth of teacher preparation both have an impact on teachers' capacity to provide effective instruction in math problem solving.

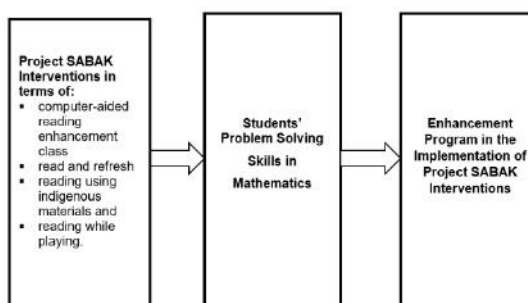


Figure 1. Conceptual Framework of the Study

All over the world, textbooks seem to play an important role in mathematics education at all levels, and thereby students' reading activity and reading comprehension also play important role.

It seems like most research in mathematics education about reading comprehension has been done in a manner that reduces reading to a potential obstacle for learning, for example, by focusing on how limitations in reading ability affects learning in mathematics or on readers' misunderstanding of a written problem and on how this can influence the solving of the problem (Österholm, 2006).

It has been found that the cooperation of the school and families on reading comprehension plays an important role on the performance of the students. When teachers and parents involve in their children's education, not only students will have higher achievement in schools but also the morale and the motivation of the individuals will increase (Akbaşlı, Şahin & Yakiran, 2016).

Mathematics is one of the core subjects in the K to 12 program. Developing critical thinking and improving problem-solving skills across all subject areas is one of the major goals of the Department of Education under Enhanced Basic Education Curriculum (EBEC) known as RA10533. The National Council of Teachers of Mathematics stressed that the art of the problem solving is the heart of mathematics (NCTM, 2000). The NTM has strongly endorsed the inclusion of math problem solving in school. As instructional managers, teachers should find ways of stimulating the learners to love mathematics and must learned not only for its many practical applications, but also for its recreational aspects. Thus, mathematics instruction should be designed so that students experience in mathematics as problem solving. The proponent being a mathematics teacher intensely believed that project SABAK interventions have something to do and play a vital role in improving students' problem solving skills in mathematics. The study generally aimed at evaluating the effectiveness of Project SABAK interventions and students' problem solving skills in Mathematics in Ichon National High School. Specifically, this sought to evaluate the effectiveness of Project SABAK interventions and assess the students' problem-solving skills in Mathematics.

2.0 Theoretical / Conceptual Framework

This study anchors on a Problem-Solving Domain Theory by Schoenfeld (1985). Schoenfeld (1985) presented a view of understanding in teaching mathematics should be approached as a problem-solving domain. Schoenfeld (1985) cited four categories of knowledge or skills needed to be successful in mathematics: Resources – proposition and procedural knowledge of mathematics should be a fundamental requirement to every individual. This knowledge may achieve if an individual has the comprehension and strong foundation in the operations in mathematics. Heuristics – strategies and techniques for a problem solving such as working backwards, or drawing figures. Trial and error strategy could be another way to help an individual to solve the problem. Control – decisions about when and what resources and strategies to use are essential part in a problem solving process. The decision on what appropriate operation to be use which requires a depth understanding to make your solution correct. Beliefs – a mathematical “world view” that determines how someone approaches a problem. Solving mathematics problem is just a manner of psychological conditioning on how individual perceive a problem or just a routine activity that need to be solve.

The interventions of the project SABAK have something to do with Schoenfeld’s theory because it works in cognitive psychology, particularly the emphasis on the importance of metacognition and the cultural components of learning mathematics. Schoenfeld’s theory is supported by extensive protocol analysis of students’ problem solving skills. Problem solving skills requires comprehension maturity of an individual to respond, to understand, to decide and to solve problems in mathematics.

The ultimate aim and focus of this study centered on the effectiveness of the project SABAK interventions and the students’ problem solving skills in Mathematics. Positive impact of the interventions would be monitored and evaluated using survey questionnaire and a quarterly assessment on the problem solving. Expected performance of the students’ quarterly assessment would be based on the performance standard set by the Department of Education of 75% mean percentage score.

3.0 Methodology

The study utilized a mixed methods research design combining both quantitative and qualitative research approaches. Qualitative in the sense, it involves collection, recording, analysis and interpretation of the data gathered from the respondents. Qualitative because it involves perceptions and consideration of the respondents’ point of view. This research design was found to be appropriate because this could be the basis to evaluate the effectiveness of the project interventions in terms of; computer-aided reading enhancement class, read and refresh, reading using indigenous materials, and reading while playing. This study was conducted in Ichon National High School, District of Macrohon, Division of Southern Leyte. Ichon NHS has its land area of 14,480 square meters, occupied by 22 buildings with 33 classrooms. Ichon NHS is located in the interior part of Barangay Ichon and seven (7) kilometers away from the heart of the Municipality of Macrohon, Province of Southern Leyte, Philippines. The respondents of this study were the 120 grade seven students who underwent the project SABAK interventions and quarterly assessment on problem solving from 2nd quarter to 4th quarter. There were twenty (20) respondents who underwent the survey and another twenty (20) respondents for the Focused Group Discussion (FGD). The respondents comprised from the students, teachers and parents. The study utilized a teacher-made test comprising five (5) problems per intervention. Each item has four (4) points; 1 point for identifying the correct given data, 1 point for identifying what is asked, 1 point for the operation to be used, and 1 point for the correct answer. The assessment would cover from 2nd quarter to 4th quarter exclusive with those competencies that have problem solving. The DepEd Measurement and Evaluation tool (M&E) would be utilized to determine the problem solving skills mastery level of the students’ performance in quarterly assessment. A survey questionnaire and a checklist of questions will also be made for the Focus Group Discussion (FGD).

For validity test, the researcher prepared a general survey questionnaire on the effectiveness of the school’s project banner interventions. This was properly reviewed by the English Department teachers for corrections and enhancement. The quarterly summative test in mathematics problem solving would be reviewed and evaluated by the Mathematics Department teachers for further modification of the test. The Master Teachers in English and in Mathematics Department had stretched some Technical Assistance (TA) for the corrected questionnaires. The corrected instrument was submitted to the thesis panel members for further analysis and improvements. On the data gathering procedure, the students’ performance on the problem solving would be computed per quarter whether there is a positive or negative trend of the mean percentage score or MPS. The

Survey questionnaire being gathered would evaluate specifically on the effectiveness of the project SABAK interventions. Focused Group Discussion (FGD) would be conducted to determine the perceptions, observations, experiences and suggestions from the respondents' point of view.

The results of this study were tabulated and interpreted based on the prescribed rating scale. For interpretation of the scores obtained by the respondents' survey. The mean ranges values together with the corresponding descriptions are presented below.

<i>Value</i>	<i>Weight</i>	<i>Description</i>
4.1 – 5.0	5	(SA) Strongly Agree
3.1 – 4.0	4	(A) Agree
2.1 – 3.0	3	(U) Undecided
1.1 – 2.0	2	(D) Disagree
0 – 1.0	1	(SD) Strongly disagree

The results of the quarterly assessment on problem solving are interpreted using the DepEd M&E Tool.

<i>Rating</i>	<i>Description</i>
96- 100	Mastery
86- 95	Closely Approximately Mastery
66- 85	Moving Towards Mastery
35- 65	Average Mastery
15- 34	Low Mastery
5- 14	Very Low Mastery

Statistical Treatment of Data

Responses from the survey were summarized using frequencies and averages for categorical data. Finally, descriptive and inferential statistics were applied to the performance of the students to the extent in which they are comparable.

To determine the performance of the students, the MPS was calculated using the formula:

$$MPS = \text{Total no. of correct responses of the group} / (\text{No. of test items}) \times (\text{no. of examinees})$$

To test the hypotheses, the *Pearson Product Moment Coefficient of Correlation* was employed.

4.0 Results and Discussion

This chapter arranges the results of analysis and interpretation of data obtained through the quarterly assessment of the respondents from 2nd quarter to 4th quarter on problem solving and other documentary information provided by the respondents during the data gathering of this study such as the survey questionnaire and the Focused Group Discussion. Results are organized and presented in tables and in graphs in accordance with the objectives of the study which are followed by their corresponding discussion.

Effectiveness of Project SABAK

Table 1: Quarterly Mean Percentage Score (MPS) of Students applying Computer-Aided Reading Enhancement Class (CARE-C).

Statistics	2nd Quarter	3rd Quarter	4th Quarter
Mean	14.17	15.03	15.51
SD	2.0098	1.9336	1.3902
MPS	70.83%	75.13%	77.54%

Table 1 shows a gradual progression of the mean score and mean percentage score. The diminishing trend of standard deviation shown that the scores were changing from dispersing to more homogeneous. This trend shown that the intervention helped the outliers or the low performing students catch-up with the performing learners. This would imply that CARE-C intervention have positive effect to the students' performance in the problem solving.

Table 2: Quarterly Mean Percentage Score (MPS) of Students applying Read and Refresh (RARE)

Statistics	2 nd Quarter	3 rd Quarter	4 th Quarter
Mean	14.64	15.03	15.51
SD	2.2596	1.9743	1.3962
MPS	73.21%	75.17%	77.54%

Table 2 shows a gradual progression of the mean score and mean percentage score. The diminishing trend of standard deviation shown that the scores were changing from dispersing to more homogeneous. This trend shown that the intervention helped the outliers or the low performing students catch-up with the performing learners. This would imply that RARE intervention have positive effect to the students' performance in the problem solving.

Table 3: Quarterly Mean Percentage Score (MPS) of Students applying Reading using Indigenous Materials (RIM).

Statistics	2 nd Quarter	3 rd Quarter	4 th Quarter
Mean	14.51	15.58	15.57
SD	2.2641	2.0066	1.4126
MPS	72.54%	77.92%	77.83%

Table 3 shows a slight negative difference between quarter 3 and quarter 4 in terms of mean and MPS. These may be caused by a spiral progression of the topics and uncontrolled factors, but the result did not negate the positive effects of the intervention.

The diminishing trend of standard deviation shown that the scores were changing from dispersing to more homogeneous. This trend would imply that the intervention helped the outliers or the low performing students catch-up with the performing students.

Table 4: Quarterly Mean Percentage Score (MPS) of Students applying Reading while Playing (RP).

Statistics	2 nd Quarter	3 rd Quarter	4 th Quarter
Mean Score	14.58	15.68	15.67
Standard Deviation	2.3392	2.0091	1.4514
MPS	72.92%	78.38%	78.33%

Table 4 shows a slight negative difference between quarter 3 and quarter 4 in terms of mean and MPS. These may be caused by a spiral progression of the topics and uncontrolled factors, but the result did not negate the positive effects of the intervention. The diminishing trend of standard deviation shown that the scores were changing from dispersing to more homogeneous. This trend would imply that the intervention helped the outliers or the low performing students catch-up with the performing students.

Table 5: Students, Teachers and Parents' Feedback on the Intervention and Effects of Computer- Aided Reading Enhancement Class (CARE-C). Average Rating on the Intervention and effects of CARE-C (n=20).

CARE-C Intervention/Effects	WM	Description
1. The school has a strong support from the internal and external stakeholders.	4.40	Strongly Agree
2. The school has adequate resources and materials to support the project.	3.90	Agree
3. The school provides dissemination of information of the project.	4.15	Strongly Agree
4. The intervention provides equal opportunity among students to enhance reading comprehension skills.	4.25	Strongly Agree
5. The intervention helps improved the students' performance in mathematics.	4.15	Strongly Agree
6. The intervention provides regular monitoring of students' mastery level.	4.05	Strongly Agree
7. The students are more active in mathematics class.	3.75	Agree
8. The teacher conducts the intervention regularly.		
9. The teacher is updated, upgraded, and enhanced in the techniques in the implementation of the intervention.	4.10	Strongly Agree
10. The school head monitors in the conduct of the intervention.	4.20	Strongly Agree
AWM	4.15	Strongly Agree
	4.11	Strongly Agree

Table 5 shows the result of the survey responded by some teachers, parents and students. Based from the computed average weighted mean of 4.11. This shown that the respondents' perceptions on CARE-C intervention have yield a positive effect.

Table 6: Students, Teachers and Parents' Feedback on the Intervention and Effects of Read and Refresh (RARE). Average Rating on the Intervention and Effects of RARE (n=20).

RARE Intervention/Effects	WM	Description
1. The school has a strong support from the internal and external stakeholders.	4.25	Strongly Agree
2. The school has adequate resources and materials to support the project.	4.05	Agree
3. The school provides dissemination of information of the project.	4.20	Strongly Agree
4. The intervention provides equal opportunity among students to enhance reading comprehension skills.	4.10	Strongly Agree

5. The intervention helps improved the students' performance in mathematics.	4.00	Agree
6. The intervention provides regular monitoring of students' mastery level.	4.30	Strongly Agree
7. The students are more active in mathematics class.	3.70	Agree
8. The teacher conducts the intervention regularly.		
9. The teacher is updated, upgraded, and enhanced in the techniques in the implementation of the intervention.	4.20	Strongly Agree
10. The school head monitors in the conduct of the intervention.	4.05	Agree
	4.15	Strongly Agree
AWM	4.10	Strongly Agree

Table 6 shows the result of the survey responded by some teachers, parents and students. Based from the computed average weighted mean of 4.10. This shown that the respondents' perceptions on RARE intervention have yield a positive effect.

Table 7: Students, Teachers and Parents' Feedback on the Intervention and Effects of Reading using Indigenous Materials. Average Rating on the Intervention and Effects of RIM (n=20).

RIM Intervention/Effects	WM	Description
1. The school has a strong support from the internal and external stakeholders.	4.45	Strongly Agree
2. The school has adequate resources and materials to support the project.	4.05	Agree
3. The school provides dissemination of information of the project.	4.15	Strongly Agree
4. The intervention provides equal opportunity among students to enhance reading comprehension skills.	4.30	Strongly Agree
5. The intervention helps improved the students' performance in mathematics.	4.00	Agree
6. The intervention provides regular monitoring of students' mastery level.	4.15	Strongly Agree
7. The students are more active in mathematics class.	3.90	Agree
8. The teacher conducts the intervention regularly.		
9. The teacher is updated, upgraded, and enhanced in the techniques in the implementation of the intervention.	4.10	Strongly Agree
10. The school head monitors in the conduct of the intervention.	4.05	Agree
	4.10	Strongly Agree
AWM	4.13	Strongly Agree

Table 7 shows the result of the survey responded by some teachers, parents and students. Based from the computed average weighted mean of 4.13. This shown that the respondents' perceptions on RIM intervention have yield a positive effect.

Table 8: Students, Teachers and Parents' Feedback on the Intervention and Effects of Reading while Playing. Average Rating on the Intervention and Effects of RP (n=20).

RP Intervention/Effects	WM	Description
1. The school has a strong support from the internal and external stakeholders.	4.20	Strongly Agree
2. The school has adequate resources and materials to support the project.	4.10	Strongly Agree
3. The school provides dissemination of information of the project.	4.20	Strongly Agree
4. The intervention provides equal opportunity among students to enhance reading comprehension skills.	4.15	Strongly Agree
5. The intervention helps improved the students' performance in mathematics.	4.05	Agree
6. The intervention provides regular monitoring of students' mastery level.	4.05	Agree
7. The students are more active in mathematics class.	3.85	Agree
8. The teacher conducts the intervention regularly.		
9. The teacher is updated, upgraded, and enhanced in the techniques in the implementation of the intervention.	4.25	Strongly Agree
10. The school head monitors in the conduct of the intervention.	4.05	Agree
	4.15	Strongly Agree
AWM	4.11	Strongly Agree

Table 8 shows the result of the survey responded by some teachers, parents and students. Based from the computed average weighted mean of 4.11. This shown that the respondents' perceptions on RP intervention have yield a positive effect.

Focus Group discussion (FGD):

Focus group discussion was deliberated to gather relevant information coming from the voice of the internal and external stakeholders of Ichon National High School. This will also serve as a benchmark for the school to enhance, improve and modify the current interventions when it comes to reading comprehension for improving the students' performance in the problem solving in mathematics. Questions were translated in mother tongue to let the parents respond appropriately.

- Which of the project SABAK interventions you like most? (CARE-C, RARE, RIM, RP), Why? (*Asa sa mga interventions sa project sabak imong ganahan pag-ayo? Ngano man?*)

(Parent #1 and #4) “”. Children much enjoy in reading while playing because they will not get bored in the class. In a statement “All study, no play makes your kid dull”. The study of Amika Singh (Jan 03, 2012), from Vrije University Medical Centre in Amsterdam, wrote in the journal Archives of Paediatrics & Adolescent Medicine: "According to the best-evidence synthesis, we found strong evidence of a significant positive relationship between physical activity and academic performance. The findings of one high-quality intervention

study and one high-quality observational study suggest that being more physically active is positively related to improved academic performance in children."

"Unanimous of the students like reading while playing and read and refresh because they love playing and much better if they were given snacks and refreshments after the activity"

(Teacher # 1, #3 and #5) "Students *para namo ang RP ang ilang ganahan kay dili sila boringan kay ang klase gi-ubanan ug duwa-duwa* love most in reading while playing because they do their best in answering the questions so that they can win and claim prizes".

▪ *How do teachers or parents monitor and evaluate the performance of the students' problem solving skills in mathematics? (Gi-unsang mga teachers ug parents pag sukod sa performance sa mga studyante mahitungod sa problem solving skills sa math?)*

(Parent #2 and #5) "Among monitoron ang mga bata sa pagbisita kanunay sa eskwelahan aron maka storya ang mga magtutudlo ug pag tambong ug meeting kada tabo sa kinaadman". Through regular follow-up with the teachers and attend quarterly portfolio and card day in school, we can monitor the performance of our students". Parental participation improves student academic achievement: A case of Iganga and Mayuge districts in Uganda (G.M. Mahuro and N. Hungi,2016), parental participation increases children's academic achievement. The regression model's results indicate that unit increase in parental participation through parenting and communication increases students' numeracy by 6 and 15 scores, respectively. Parental participation is pivotal in motivating children's academic grades. Learning should not be solely left to the student-teacher relationship but should enhance active parental involvement.

(Teacher #2 and 4) "Giving the students formative, summative, quarterly assessment, and expose the students more on problem solving exercises. Let them realize that problem solving is part of their daily life and this could help them to love mathematics".

▪ *How do the interventions of project SABAK help improved the students' problem solving skills in mathematics? (Gi-unsang mga project sabak interventions pagtabang aron ma improve ang problem solving skills sa mga studyante?)*

(Teacher #3 and 5) "Through constant exposure in reading comprehension and giving problem solving sets as part of their daily routine in mathematics class will make the students more abreast in analyzing what's the word problem all about".

(Student #2, #5, #7, and #9) "Through regular practice and engagement to problem solving exercises in mathematics can make us improve our skills in solving word problems".

▪ *Does project SABAK interventions help the students to become mature learners? Why? (Ang mga project sabak interventions ba nakatabang aron mahimong hamtong ang mga studyante? Ngano man?)*

(Parent # 2 and 3) "Oo,kay ang mga bata kamao na makasabot na sa ilang gibasa ug maka comprehend na". Yes, the interventions help the students become mature and increase their level of understanding. According to (Duffy, 2003) reading and understanding is a complex process that requires continuous practice, development and refinement, creativity and critical analysis. Reading maturity is a constructive process that looks broadly at reading development encompassing not only basic reading skills but reading habits, attitudes, and dispositions (Matt Thomas 2013).

(Teacher #3 and 34) "Through these interventions, students become more mature individuals because they worked and collaborate as a group to solve a particular problem in mathematics".

(Students # 6, #8 and #10) "The interventions help us become mature because it encourages us to analyze the given problem and worked as a team. Collaboration among us will be able to solve the problems given by the teacher". Collaborative learning is very important in achieving critical thinking. According to Gokhale (1995), individuals are able to achieve higher levels of learning and retain more information when they work in a group rather than individually, this applies to both the facilitators of knowledge, the instructors and the receivers of knowledge, and the students.

▪ *Which among the interventions is/are most effective in improving the students' problem solving skills in mathematics? Why? (Asa sa mga project sabak interventions ang pinaka epektibo sa pag-improve sa problem solving skills sa math? Ngano man?)*

(Parent # 2) “Ang reading while playing kai dali ra makasabot ang mga bata ug ganahan sila kung ang pagklase ipaagi ug duwa-duwa”. Reading while playing is the most effective because solving math problems through playing would not be boring to the part of the students. Every child must become fully competent in reading to succeed in school. In fact, reading is the foundation of much enjoyment in life and is closely related to vocational efficiency (Douglas, 2000). The impact of Reading for Pleasure findings support that reading for pleasure while exercising is more enjoyable and attention focusing resulting in more positive affective responses, thus reading for pleasure may provide a stronger distraction compared to reading material that is related to daily life stress (Rachel M. Day, 2010).

(Student #1, #2, #5, #7 and #9) “Reading while playing is the most effective intervention because it helps us better comprehend and solve the problems in mathematics through games and competitions”.

- What other interventions can you suggest to further develop the students’ problem solving skills in mathematics? (*Unsa kahay lain nga intervention nga imung ikasugyot aron mapalambo pa ang performance sa mga studyante sa problem solving skills sa math?*)

(Parent # 1, #3, and #5) “*kanang sa ilang club o sa bakanting oras, mas mayo kung sila magtinabangay sa pagtuon arun madugangan ang ilang kaalam sa pagsabot*”. During club hours or vacant time, students should continue their study as a group to further enhance their skills in math problems. Using Literature Circles to Increase Reading Comprehension, students developed better comprehension skills while increasing social skills that will lead to enriched learning (Bender & Larkin, 2003). Grouping students for a literature discussion group differs depending on the composition of the groups. Factors to consider are heterogeneity or homogeneity, personality, student book choice, and special needs students. Heterogeneous grouping can include gender, race, or ability. Several studies advocate a mixed gender grouping since one dominating student can control the whole discussion. Gardener’s theory of multiple intelligences is one way of separating a class into groups. Groups can be arranged with strengths as a factor, but individuals should eventually move to a group that might be out of her or his comfort zone (Gallavan & Kottler, 2002).

(Teacher #1, #4 and #5) and (Students #1, #2, #3, #5, #7 and #9) “The interventions are ideal strategies to enhance students’ skills in the problem solving in mathematics”. George R.R. Martin said a reader lives a thousand lives before he dies, but a man who never reads lives only one. This line inspires the teachers of Ichon National High school to inculcate the love for reading to their clientele and to improve their reading comprehension skills as a fundamental skill in mathematics problem solving.

(Teacher #2 and #3) “The utilization of CAIMS-computer-aided instructional materials can be a great help and supplement the students’ comprehension level when it comes to the problem solving in mathematics. Students now a days are fun of using gadgets, mobile phones and computers.

The feedbacks provided by the respondents during the Focus Group Discussion illustrates the multi-dimensional benefits and positive impacts brought about on the interventions of project SABAK in improving students’ problem solving skills in mathematics. These are the reasons why the program should be continued and look for ways and means to further improve its existing implementation with the support of the internal and external stakeholders of Ichon NHS.

Students’ Problem Solving Skills in Mathematics

Table 9: Mastery Level of Students’ Problem Solving Skills in Mathematics.

Mastery level	2 nd Quarter		3 rd Quarter		4 th Quarter	
Mastery (96-100)	0	0	0	0	0	0
Closely Approximately Mastery (86-95)	0	0	6	5	4	3.33
Moving Towards Mastery (66-85)	100	83.33	95	79.17	105	87.5
Average Mastery (35-65)	20	16.67	19	15.83	11	9.17
Low Mastery (15-34)	0	0	0	0	0	0
Very Low Mastery (5-14)	0	0	0	0	0	0
Absolutely No Mastery (0-4)	0	0	0	0	0	0
TOTAL	120	100%	120	100%	120	100%

Table 9 shows the mastery level of students' problem solving skills in mathematics. This result was based on the competencies with problem solving skills.

In the 2nd quarter, 16.67% of the students were categorized to average mastery and 83.33% of the students in moving towards mastery. In the 3rd quarter, 15.83% of the students were categorized to average mastery, 79.17% of the students in moving towards mastery and 5% of the students have increased to their mastery to closely approximately mastery. In the 4th quarter, 9.17% of the students were categorized to average mastery, 85.7% of the students in moving towards mastery and 3.33% of the students have increased their mastery level to closely approximately mastery.

Relationship between the project SABAK Interventions and Students' Problem Solving Skills in Mathematics.

Table 10: Relationship between (CARE-C, RARE, RIM and RP) and Students' Problem-Solving Skills in Mathematics.

Variables	r-value	p-value	Interpretation
Computer-Aided Reading Enhancement Class and Students' Problem-Solving Skills in Mathematics	0.496 Moderate correlation	0.000	H ₀ rejected Significant
Read and Refresh and Students' Problem-Solving Skills in Mathematics	0.510 High correlation	0.000	H ₀ rejected Significant
Reading using Indigenous Materials and Students' Problem-Solving Skills in Mathematics	0.484 Moderate correlation	0.000	H ₀ rejected Significant
Reading while Playing and Students' Problem-Solving Skills in Mathematics.	0.520 High correlation	0.000	H ₀ rejected Significant

Significance level alpha = 0.01

Table 10 shows a positive correlation coefficient of the four interventions. This would indicate that there was a direct relationship between the two variables, the reading comprehension and the students' problem solving skills. The interventions had developed and shown positive increase of their performance.

The p-value of 0.000 would imply that the relationship stated above is highly significant. Thus, research hypothesis is rejected.

Develop an Enhancement Program in the Implementation of Project SABAK interventions.

To concretized this phenomenal research during the course of the activity was conducted. Observation and experiences on the beneficial effects of the project SABAK interventions will put into consideration. Feedbacks provided by the respondents during the focus group discussion and survey illustrate the multi-dimensional benefits and positive impacts brought about on the project interventions would have laid and presented in details.

From the point of view from the teachers and parents, the development for an enhancement program of project interventions would consider on the integration of CAIMS- computer-aided instructional materials in the course of intervention and the adaptation of the reading circle encounter among the students through academic

club's gathering. This enhancement program can be a great assistance to the current school project interventions in developing students' reading comprehension level in the application of the problem solving in mathematics.

5.0 Conclusion and Recommendations

As gleaned from the findings of the study, project SABAK interventions were effective in enhancing and improving the students' performance in the problem solving in Mathematics. These interventions could be of great help in improving the students' mastery level. Based on the implication of the results, the following recommendations are the interventions should be sustained and should be integrated across all learning areas both in the junior and in the senior high school to enhance students' literacy and numeracy skills. The school authorities should be open in terms of suggestions and feedbacks coming from the parents and stakeholders for improvement, enhancement and advancement of the project interventions. And teachers should give more attention for those topics with difficult learning competencies.

6.0 References

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