

# “Efficacy of Sim in Improving the Academic Performance of Grade VI Pupils in Science in the New Normal”

(AN ACTION RESEARCH)

GRACE G. HILOMA

Teacher III Beguin Elementary School

Bulan III District Schools Division of Sorsogon S.Y. 2021-2022

**Abstract:-** This study aimed on improving the performance of Grade VI learners through the use of Strategic Intervention Material in the new normal. It utilized experimental research design. The respondents were the 34 Grade VI pupils of Beguin Elementary School, Bulan III District of the S.Y. 2021-2022. A Strategic Intervention Material (SIM) was used as aid in improving the academic performance of Grade VI pupils in Science and post-assessment was conducted to prove the efficacy of the intervention material. The data that were gathered were analyzed and interpreted with the use of statistical tools and measures such as weighted mean and t test.

Findings of the study show that there's a highly significant difference in the performance of pupils using the Strategic Intervention Material as a tool to improve learners academic performance based from the post assessment conducted compared to the result of the summative test evaluated . After the use of Strategic Intervention Material that show values, it increased to 12.56 mean difference from the result of the sumative test which is 21.03 to post test result of 33.59. There is a highly significant increase on the results of the learners performance based from the performance level computed from 42.06 of the summative test to 67.18 of the post-test with 25.12 difference. The computed t test is 30.65 and the T value at 5% which is 0.00. Thus, the null hypothesis is rejected.

Based from the findings, the following conclusions were drawn: the mean of the learners result before the use of Strategic Intervention Material was low with an average of 21.03. However, there's a highly significant increase of 28% in the mean of the pupils post test result after the use of the SIM. It is noted with the performance level of 67.18 ; using of Strategic Intervention Material Tool has positive impact in enhancing the academic performance of the learners; and there was a significant increase on the average mean of Grade VI pupils after using the intervention. Although the target passing of 75% from the DepEd standard was not attained, a commendable improvement in the academic performance based from the result was regarded a success with nearing mastery level.

It is recommended that teachers be encouraged to develop materials that can be used to enhance the academic performance of the pupils in the subject area;

the SIM may be enhanced, reproduced, modified and be utilized by teachers and pupils in Bulan III District; and further researches may be conducted on the development, validation and effectiveness of instructional materials on the other grade levels or subjects.

## I. INTRODUCTION

Quality education for all citizens at all levels is the mandate of the constitution of the Republic of the Philippines. As stipulated in Article XIV, Section 1 of the 1987 constitution; “ The state shall protect and promote the rights of all citizens to quality education at all levels and shall take appropriate steps to make such education accessible to all.” Education is essential for everyone. It helps people earn respect and recognition. It is indispensable in all aspect of life, however, the standard of education is still a major problem that needs to be solved. Despite being a middle-income country with sufficient resources to support children's education, many Filipino children miss out an opportunity to learn (UNICEF, 2021). It is essential that every Filipino child, whatever their circumstance, has access to learning that offers a quality, inclusive and relevant curriculum. UNICEF advocates for greater investment in the country's cognitive capital with skilled teachers, engaging educational materials, facilities for learning and better pay for a decent living.

Due to Covid-19, education issues in the Philippines have increased and received new challenges that worsened the current state of the country. Of the worlds student population, 89% of 1.52 billion are children and youth out of school due to COVID-19 closures, in the Philippines, close to 4 million students were not able to enroll as per DepED data (Rappler, 2020). The Department of Education launched distance learning and implemented blended learning program which involves online classes, printouts and lesson broadcast that responded to new and sudden changes towards improvement of the quality of education in public schools by proving appropriate intervention for the students as well as upgrading teachers competence in teaching the said subject even in the middle of health crisis.

Educating the 21<sup>st</sup> century skill to the learners makes them capable of all the advances the world has to offer and gives benefit to people. As of today, there are so many influences that open doors for learners to understand the different innovations and phenomenon that occurs in the

environment and part of it is the technological advancement like internet, social media and other websites that offer easy access in everything around us. But as they say, there is no powerful tool that can beat the innovative mind of people, that is why teachers gave everything in their might to give pupils the learning that they needed and deserved. However, despite of the great demands to equate competence and attitude among learners, still some problems on the academic performance of students arise. Teachers find difficulty in providing learners with appropriate teaching strategies and tools. This depressing scenario is observed in the schools in Bulan III District including Beguin Elementary School.

National Achievement Test results shows that Science continues to be one of the most difficult field of study in the basic and K to 12 curriculum. In fact, in a 2018 study found that a sample of 15-year-old Filipino students ranked 78<sup>th</sup> in Science and in Mathematics that came from public schools. This implies that the Philippines doesn't invest on topnotch learning compared to its neighboring countries. The Trends in International Mathematics and Science study 2019 shows the Philippines scored significantly lower than any other country that participated in Grade 4 Math and Science Assessments. The country also scored the lowest among all 58 participating countries for both tests (Magsambol, 2020). As for Science, 13% of Filipino students were also on the low benchmark, which means they had limited understanding of scientific concepts and limited knowledge of foundational science facts, while 87% did not even reach this level. It is said that this international assessment is a step forward towards addressing learning gaps in the country's basic education (Rappler, 2020).

As part of the teaching enhancement, this research study in Science was created to help educators and learners who did not attain the required level of mastery of the competency which was determined from the results of the assessment of the Grade Six pupils in the modular form of learning. One of the least learned skills identified from the data gathered in Science VI at Beguin Elementary School in which this research was focused was about Mixture and the different techniques of separation. Science education provides skills and knowledge that are necessary for a person to live in what (Knight, 1986) describes as the age of science and to develop a citizen that will meet the goals of science in the society (Tilghman, 2005). This motivated the researcher to pursue this study.

Beguin Elementary School is located at Beguin, Bulan, Sorsogon. It has an average population of 250-270 pupils per school year. It has a positive learning climate that enables learner to learn in conducive way. It has received numerous awards in academics being one of the competent schools in Bulan III District. However, despite of the positive feedback in terms of its competence, still the school personnel encounter problems with the academic struggles in other subject areas such as Science.

With the aforementioned problem, the proponent of this study thoroughly crafted and analyzed the intervention to be made to help attain the level of mastery if not at least

improve the academic performance of the pupils as well as help other teachers teaching the same subject and other grade levels. The tool used in this study was the Strategic Intervention Material (SIM) made by the researcher itself. At present, the same scenario was encountered by the proponent and proposed the use of this Strategic Intervention Material to prove its efficacy in a form of research study to improve the pupils' performance in the new normal form of learning.

This Science research material together with the Strategic Intervention Material entitled Make Sure it's Mixture, the proponent is determined to give thorough realization of the efficacy of using a SIM to improve the academic performance of the pupils in Science VI with certainty of the concept if applied to concrete objects even just learning it at home or in application to real scenario. The goal is to achieve the mastery level or at least improve the performance level of the pupils the learning competency.

## II. RESEARCH QUESTION

This will determine the efficacy of SIM in improving the academic performance in the new normal. Specifically this sought to answer the following questions:

- What is the performance level of Grade VI-pupils in Science before and after the:
  - Use of Strategic Intervention Material
- Is there a significant difference in the performance level of the pupils before and after using Strategic Intervention Material?
- What can be recommended based on the result of the study?

## III. PROPOSED INNOVATION, INTERVENTION AND STRATEGY

Science is more than a body of knowledge. Its way of thinking; a way of skeptically interrogating the universe (Carl Sagan). It is a subject that dealt with the basic to the complex learning applied in real life situation of every individual and must be learned so that it will make work easier and simpler. However, based on the 2014 National Achievement Test for grade six pupils the passing rate is only 69.21% which is classified as low. Because of this, there are numerous factors discovered that limits science education in the Philippines such as the shortage of qualified science teachers, lack of quality textbooks, inadequate instructional materials and equipment, large classes and lack of support from administrators and now the health crisis affecting the children in their education. In addition, it was found that lack of instructional materials and equipment and innovation in school has been used to account for the poor performance of students (SEI-DOST & UP NISMED, 2011).

Furthermore, due to the health crisis and educational struggles faced by the education sector because of COVID-19, the traditional learning process and goal was altered and became distance blended learning where students are not used to. And one of the problem encountered during this mode of learning is that the poor performance of pupils

worsened in subject areas such as Science. It was evident in the performance level of learners evaluated from the given assessment tool the below mastery level of learning.

The development of this SIM hoped to improved the learning performance to the least learned identified, this material is anchored in a simple process which followed: Phase I- Preparation, Phase II-Development, Phase III-Validation and Phase-IV Try-Out. This is also an individualized and contextualized material which can be administered in a 1:1 ratio of the material and pupil, regardless of the pupils' learning level of ability. This study was conducted among 34 Grade VI pupils of Beguin Elementary School for school year 2021-2022. The summative test and post test is in multiple choice form, covering the first quarter competency were used to evaluate their performance in relationship to their scores.

#### A. Strategy

The pupils went into 3 weeks intervention. The intervention had 3 phases, the first phase was the introduction of the SIM where in the researcher gave an overview of the content of the SIM and how to use the self-assessment tool without any help or guidance from the parents or guardian. This was conducted through a house-to-house visit. The phase two of the intervention was the hands-on usage of SIM by the learners, the teacher requested the parents' permission of the involved learners for a limited face-to-face interaction for the pilot testing of the said tool. The researcher provided each learner a copy of the intervention material. The pupils were able to record their scores and improvement using the descriptive score sheet from each part of the SIM. The actual hands-on of the SIM was held at the designated classroom conducive for learning and properly observed health protocol. Learners were scheduled by time to avoid a congested learning area and any health situation to secure learners safety.

Post test was administered at the phase 3 of the intervention, where the learners actual participation in limited face-to-face manner securing permission from the parents and observing proper health guidelines. Time of the conduct was observed, given only by a maximum of 60 minutes or 1 hour to answer all the 50-item teacher made test.

#### B. Intervention

Based from the result of the post assessment, it was proven that there is an improvement in the academic performance of the learners after the utilization of the intervention material, however, the researcher analyzed the result and found out it did not meet the prescribed DepEd mastery level of 75% above average instead only improved 28% from the summative/pre-test result, thus highly significant difference was evident. The difficulty of the competency and the mode of learning was considered by the researcher as factors in not attaining the mastery level, moreover, the utilization of SIM brought improvement and found effective to the academic performance of the learners in Science. The researcher thought of providing more

supplemental or enrichment activities for learner to familiarize the terms about the competency discussed, by this, pupils will not find it difficult to understand the topic and mastery of skills will be attained.

#### C. Innovation

The researcher-teacher developed a contextualized Strategic Intervention Material or SIM for the specified learning competency in Science VI. The Contextualized Strategic Intervention Material or SIM was focused on the improvement of the academic performance of the pupils based on the identified least mastered skills particular about techniques in separating mixture. This intervention material created by the proponent consist of activities that will make the learning process interactive, creative, enjoyable, and fun. It also shows a more thorough discussion for learners to understand the topic creatively. By means of using this intervention material, the proponent is confident that this will improve the academic endeavor of the learners having difficulty in understanding or mastering the learning competency. Revision and improvement of the material is highly suggested to further enhance the learners learning progress.

### IV. ACTION RESEARCH METHODS

#### A. Participants and other sources of data and information

The respondents of this study were the thirty four (34) Grade VI pupils of Beguin Elementary School composed of two sections, the Einstein and the Newton. This study was conducted in the first quarter of school year of 2021-2022. Other elementary learners in the school were excluded in this study. Teacher factor is not considered in this study.

The study was undertaken October 2021, however due to several factors hindering the conduct of the study and personal reasons, it was not prioritized, and one of the recommendations given by the SDRC is to adjust the conduct in the S.Y. 2021-2022 since the timeline in the study indicated was not attained. During the modular learning, the teacher provided summative test as part of the assessment to measure the learners academic performance, the result was analyzed and was evaluated and become the basis of this study. The study used experimental design of a research since the performance of the pupils will be evaluated and observed before the use and after the use of the Strategic Intervention Material.

#### B. Action Research Methods

This section presented the procedure undertaken in the conduct of the study. It includes the sampling, research design, data collection and data analysis.

##### a) Sampling

The population of this study were the two sections of Grade Six of Beguin Elementary School, Einstein and Newton. The respondents were identified only as one or the single group category. The group was composed of 34 pupils regardless of gender, 15 from the section of Einstein and 19 from the section of Newton.

Table 1 presents the distribution of respondents. Total enumeration was done due to the little population of the grade level.

Pupils	(f)	(%)
Einstein	15	44 %
Newton	19	56 %
Total	34	100%

Table 1: The Respondents

b) Data Collection

The research employed the single post-test/pre-test method. The group of pupils were all given summative test which is a 50-item teacher-made test designed to measure the mastery of the pupils in the lesson about a specific competency. The validated result was evaluated and became the basis of the study, the proponent utilized the Strategic Intervention Material which is designed to help teachers provide the learners aid in their academic struggle in Science particularly to achieve progress in their learning. The purpose of the SIM is to provide the pupils additional knowledge, skills and understanding about the scientific ideas and how to apply them in concrete objects or situation. This intervention material meant to reteach concepts to master the least learned competency or at least improve the performance level of which was not attained during their modular learning. The post-test given was the same as to the pre-test or the summative test to determine if the performance of the learners based from the result analyzed and evaluated were improved or said to be effective after the utilization of the SIM.

C. Data Collection Method/Procedure

The procedures that were utilized in this study were classified into phases namely; a)Pre-Implementation Phase; b) Developmental Phase; c)Experimental phase. Each phase was discussed below;

a) PRE-IMPLEMENTATION PHASE

This is the phase where the researcher analyzed the result of the summative test in Science VI and asked the concerned teacher for the data needed and identified the least learned skill based from the MELCs or the most essential learning competencies identified by the Department of Education applied for the blended distance learning. After coming up with the result, proper protocol was observed in the dissemination of information to the concerned individuals such as permission from the school head and orientation to fellow Science teachers. With this, the researcher drafted a research study and used the self-made-assessment created by the researcher and the Strategic Intervention Material entitled “Make Sure it’s Mixture” to help in the learner’s progress.

b) DEVELOPMENTAL PHASE

The researcher presented a research proposal to the school head submitted for proper action in the school level. Science books, manuals, reading materials and the like are examined by the researcher to cope with the needs of the pupils before proper papers are submitted. After the collection of the needed data and materials, proper actions were made.

c) EXPERIMENTAL PHASE

As soon as the research proposal was approved and upon the completion of the suggestions and revision of the title of the study, the copies of SIM as the tool to be used was given priority and was reproduced, together with post assessment. The group of learners were identified prior to the conduct of the study. The pupils are single-grouped from the two sections of Grade VI. The researcher secured permission from the parents of the learners involved to conduct limited-face-to-face assessment. The researcher utilized the SIM to all the learners involved in the study in 1:1 ratio, in this study the respondents were grouped single-handedly to avoid deprivation of the usage of SIM and for them to experience the intervention to improve their academic performance. The intervention material directed the learners to learn of their own personal experience through self-assessment method.

Post-test was administered to determine if there is an improvement in the academic performance of the learners after the utilization of the intervention material.

D. DATA ANALYSIS

The result of the summative test in Science VI for the first quarter was analyzed and evaluated and found out that there was big difference in the result compared to other subject areas with an average mean of 21.03 considered as low. The result was the basis of the conduct of the study. The result of the use of strategic intervention material determined the significant progress in the academic performance of the pupils, test result from the summative test and post-test based on the experimental method utilized t-test. This study discussed the comparative analysis of the academic performance of pupils in Science before and after the usage of the Strategic Intervention Material.

The study also utilized the weighted mean. To get the mean of the learners performance level, the given formula

was used(DepEd Order No. 74, s.2012):

$$\text{Mean (X)} = \frac{\text{Total Score}}{\text{Total No. of Respondents}}$$

To determine the significant difference between the results of the summative test and the post-observation/ post test , t-test for dependent samples was used using the given formula (Downie and Heath.

1984. Fifth Edition of Basic Statistical Methods)

$$t \text{ test} = \frac{X_1 - X_2}{SD_x}$$

Where:

- X1 is the mean of summative-test 1
- X2 is the mean of post- test 2
- SDx is standard error of difference between two means

**V. ACTION RESEARCH WORK PLAN AND TIMELINE**

ACTIVITIES	October 2021	November 2021	December 2021	January 2022
1.Analyzed the result of the summative test.				
2.Drafted a research problem and title				
3.Consulted the concerned persons/teachers especially to the school head about the study				
4.Submitted the title and presentation of research problem to district committee				
5.Seek approval from the district research committee				
6. Edited and submitted copy of the Research Proposal at the Division Research Committee				
7. Wrote letter of permission to the parents for the learners involvement				
8. Crafted Pre-Test and Post-Test and reproduced the materials				
9. SIM was prepared and reproduced				
10. Received a copy of approved research proposal for compliance to the SDRC				
11. Revised the research based from the remarks, findings, suggestions and comments				
12. Utilized the SIM and disseminated the copy to the involved learners				
13. Conducted Post Test to determine the improvement of the learners performance in the competency determined				
14. Analyzed, evaluated and computed the result. Applied necessary actions needed to complete the study				
15. Submitted the terminal report to the District Research Committee and to the Division Research Committee				

**VI. COST ESTIMATES**

<b>Activities</b>	<b>Resources</b>	<b>Expenses</b>
Pre-Implementation Phase ➤ Printing of letter asking for permission to conduct Action Research ➤ Load for internet connectivity for research	SEF	1000
Developmental Phase ➤ Printing of proposal and sample tool for action research ➤ Re-printing of revised proposal ( coupon bond,ink,folder)		
Experimental Phase ➤ Printing/Reproduction of research materials (17 copies of SIM, 36 copies of post-test,ink, A4 coupon bond,paper fastener,folder,envelops ➤ Transportation		4000
Completion of research ➤ Load for internet connectivity ➤ Coupon bond, folder		
Revision of Research ➤ Coupon bond,folder,ink ➤ Load for internet connectivity		1000
Finalization of research ➤ Load for internet connectivity ➤ Coupon bond,folder ➤ Transportation		1000
Dissemination of research ➤ Transportation ➤ Load for Internet connectivity ➤ Printing of research material		1000
Miscellaneous ➤ Other fees (consultation, snacks, etc.)		

**VII. PLAN FOR DISSEMINATION AND UTILIZATION**

Beguín Elementary School, in coordination with Department of Education, Schools Division of Sorsogon, Bulan III District, was the executing agency of this study. A steering committee that consists of the School Head, Researcher and teachers to provide and discuss the intervention using the result findings of the study. A school coordination committee was set up. The researcher prepared a monitoring and evaluation framework with accomplishment report. To ensure that the intervention tool was used, monitoring focused on effectiveness, efficiency and appropriateness of implementation results as well as quantity and quality of stakeholders participation.

Monitoring also put emphasis on replicability, adaptability and the impact in school in managing and process of documentation. Performance monitoring fully involved learners. The researcher was responsible for the compilation progress of reports received from the teacher who used the tool. The researcher consolidated and prepared accomplishment report.

The result of this study leads a new chapter in the process of improving the performance of the learners as well as the competence of teachers. The recommendations and findings from this study will be disseminated throughout the school and be introduced by way of LAC Session or INSET in the district or even the division level in the same manners. With proper consultation to experts and higher authorities' final revision and improvement of the tool was taken account ready for utilization and reference in the whole district and division . This study may serve also as guide to those researchers undertaking the same if not, or related to the study conducted.

## VIII. DISCUSSION OF RESULT AND RECOMMENDATION

### A. Performance Level of Grade VI pupils in Science before the utilization of Strategic Intervention Material (SIM)

Statistical Bases	Summative Test	Post Test
Mean	21.03	33.59
PL	42.06	67.18
Learning Level	below mastery	nearing mastery
Mean Difference	12.56	
Degree of Freedom	33	
Computed t-test	30.56	
T value at 5%	0.00	
Decision on Ho	rejected	
Conclusion	There is a significant difference	

Table 2: Statistical Result

Table 2 showed the result of the summative test before administering the or usage of the intervention material. The observed mean of the summative test in Science was 21.03 with the PL of of 42.06 which is lower compared to other subjects areas is below mastery to the DepEd target which is 75% passing scores . This result made a great impact in the Science performance level and must be given proper intervention.

### B. Performance level of Grade VI pupils in Science after the utilization of the Strategic Intervention Material

Table 2 provided the result of the pupils performance level after the utilization of the Strategic Intervention Material from the result of the post test assessment. With the post test conducted, the observed mean was 33.59 with performance level of 67.83, 12.56 mean difference 28% higher than the result of the summative test. The significant difference was evident.

### C. Significant difference in the performance level of the pupils before and after the utilization of the Strategic intervention Material

The table above provides the necessary information relative to the performance level of learners before and after the utilization of the strategic intervention material. The mean, degree of freedom, mean difference as well as the computed t-test are also reflected.

It can be gleaned from the table that there is a highly significant improvement in the performance level of learners after the use of the SIM. Analysis of the result shows that there is an improvement in the performance level of the pupils in Science after the utilization of the SIM as reflected to the computed t-test of 30.65 Further, it could be inferred that the null hypothesis is rejected at 0.00 t-value at 5% and significant difference was evident.

From the presented results, it can be inferred that the utilization of the strategic intervention material as aid in improving the academic performance of the Grade VI pupils in Science is found effective.

## IX. FINDINGS

Based from the data gathered, the following findings are revealed;

- The average mean of learners academic performance before the non-usage of SIM is 21.03 with a PL of 43.22 . The mean falls below the required average mean. This can be associated that the result was below mastery level.
- The average mean of learners academic performance after the utilization of the SIM based from the post test assessment is 33.59 with pl of 67.88. This can be associated to the result that there is a highly significant difference compared to the non-usage of intervention material.
- There is a significant increase in the result of the academic performance of the Grade VI pupils in Science after the use of the Strategic Intervention Material.
- With dependent right tailed t-test, the increase is said to be highly significant at p-value of 0.00.
- The intervention applied was effective in improving the academic performance of the Grade VI pupils in Science. Based from the result, although it did not meet the required DepEd passing score of 75%, it can be highly commended that after the use of the intervention material was effective with the level of learning in the nearing mastery. Difficulty of the competency and mode of learning was considered by the researcher as factor to further provided more supplemental or enrichment activities related to the topic to attain mastery of the competency.

## X. CONCLUSIONS

Based from the findings. The following conclusions are drawn:

- The mean of the academic performance of the learners before the utilization of the SIM fall within the below average, with the average of 21.03. However, a significant increase in the mean of the academic performance of learners after the utilization of SIM have been observed. It is noted with an average mean of 33.59 with 12.56 difference.
- Utilization of SIM has positive impact in the academic performance of Grade VI pupils in Science in the new normal which imply that the students perform better in the

post test compared to the summative test conducted and the use of SIM is effective.

## XI. RECOMMENDATIONS

The findings and conclusions of this study lead to the following recommendations:

- Teachers be encouraged to develop materials that can be used to modify the academic performance of the learners not just in Science or in a specific subject but as well as into other subjects that needed further improvement and enhancement.
- The SIM may be used to develop learners' study habit, through the interactive activities provided in the material.
- The SIM may be mass produced, modified and be utilized by teachers and pupils in Bulan District or even in the municipality, division or the like.
- Supplemental or enhancement activities may be added or given to pupils to support the intervention material given for the mastery of skill/s.
- Further researches may be conducted on the development, validation and effectiveness of instructional materials on the other grade levels or subjects.

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