INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VI, Issue I
August 2024
Available online at https://www.instabrightgazette.com

ELECTRONIC-STRATEGIC INTERVENTION MATERIAL FOR LEAST MASTERED COMPETENCIES IN SCIENCE 6 QUARTER I - TECHNIQUES IN SEPARATING MIXTURES: AN E-LEARNING TOOL FOR ACADEMICALLY-CHALLENGED PUPILS

ERIC A. MAHAYAG
Teacher III
A. MABINI ELEMENTARY SCHOOL
eric.mahayag009@deped.gov.ph

ABSTRACT

The prevalent global concern in schools and educational institutions today is the issue of underachievement. Gillies (2008) has characterized underachievement as the failure of pupils to realize their full potential. The Electronic Strategic Intervention Material (E-SIM) is an educational resource recommended by the Department of Education to address underachievement by enhancing student performance in areas where they have the least proficiency in competencies and skills. This research is focused on evaluating the impact of the E-SIM in improving competencies related to the separation of mixtures during Quarter I Week 5.

To gather data, the teacher-researcher employed both the "Test Before the Intervention" and "Test After the Intervention" for the least mastered competencies in Science 6 Quarter I Week 5, specifically focused on the topic of "The Techniques in Separating Mixtures." Additionally, the "Pupils' Perception Survey (SPS)," as developed by Espinosa et al. (2012), was utilized.

The results clearly demonstrated that the utilization of the E-SIM in addressing the least mastered competencies in Science 6 Quarter I Week 5, related to the separation of mixtures, led to a significant improvement in pupils' understanding of the subject matter. This improvement was evident in the 9.26 gain score, indicating the difference between the scores obtained before and after the intervention. This finding was further supported by the paired t-test result, which yielded a value of 7.825 at a 95% confidence level, with a p-value of

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VI, Issue I
August 2024
Available online at https://www.instabrightgazette.com

0.0000 (below the critical value of 1.729), confirming a significant difference between the scores before and after the intervention.

Furthermore, the E-SIM received a mean score of 3.52, indicating a "Strongly Agree" rating according to the Student Perception Survey. This study highlights the E-SIM's effectiveness in substantially enhancing pupils' performance in areas they struggle with the most. As a result, it is recommended that further research be conducted to explore the integration of E-SIM into regular classroom instruction.

INTRODUCTION

In the K to 12 Basic Education Curriculum, one of the core principles is inclusive learning, which ensures that every student has the opportunity to develop at their own pace through a diverse range of learning activities. Through differentiated instruction and contextualization, educators can empower each student to personalize and solidify their learning experience.

Designing suitable intervention materials for science education was already a complex task even before the onset of the pandemic. However, the current circumstances, marked by a sudden shift in the mode of instruction, have introduced even greater challenges for both educators and pupils. As traditional face-to-face teaching transitions to online learning, pupils face issues associated with this educational shift.

Regrettably, the issue of underachievement continues to affect classroom education. Underachievement, as defined by Gillies (2008), refers to the apparent inability of pupils to fully realize their potential. This is frequently linked to pupils' performance in standardized tests, which is the predominant method for evaluating and assessing learners. A low level of academic achievement serves as an indicator of underachievement.

The Department of Education has provided pupils with various alternative learning modalities to choose from, allowing them to select the one that suits them best. One of these modalities, known as Online Distance Learning, falls under the category of distance learning.

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VI, Issue I
August 2024
Available online at https://www.instabrightgazette.com

It places significant emphasis on the teacher's role as a facilitator, encouraging active student participation through the utilization of a variety of internet-based tools, as described by Villa in 2015. According to Llego in 2020, online learning offers a higher level of interactivity compared to other distance learning methods.

However, the transition to online education is unprecedented and presents considerable challenges. It tests the adaptability of teachers as they embrace this new teaching model. Educators must engage in thorough planning to develop effective strategies aimed at enhancing the outcomes of online learning, as this transition impacts the performance, interactivity, and overall learning experiences of pupils. These transitional challenges may bring about difficulties that differ from those encountered when introducing entirely new educational systems, as indicated by Raspopovic and colleagues in 2016.

The need to establish effective and well-structured approaches for teaching science subjects online is of utmost importance in enhancing critical thinking skills and other lifelong learning competencies. Learners' requirements continuously evolve, and educators must cater to the needs of all pupils, including those identified as "left behind learners." Consequently, the utilization of intervention materials becomes a crucial consideration, as mentioned by Marimella in 2016.

Hence, the objective of this research is to assess the acceptability and effectiveness of employing Electronic Strategic Intervention Material (ESIM) to enhance online scientific learning for pupils. The outcomes of this study will provide valuable insights to science instructors, aiding them in refining their methods for delivering online classes.

In the Caloocan, the outcomes of the Division-made Periodical Test offer a general assessment of pupils' performance within schools. The low average percentage scores indicate that there are pupils who have limited mastery of the concepts assessed. Pupils often fail to reach their full potential and exhibit poor performance in standardized tests.

According to the report of the District Science Coordinator Dr. Divine F. Conmigo, the Mean Percentage Score in Science of A. Mabini Elementary School, school year 2022-2023, for grade 3 is 51.25 (Nearly Proficient), for grade 4 is 44.04 (Low Proficient), for grade 5 is

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VI, Issue I
August 2024
Available online at https://www.instabrightgazette.com

46.87 (Low Proficient), and for grade is 55.47 (Nearly Proficient). The MPS shows low performance of pupils (Table 1).

Table 1: DISTRICT Mean Percentage Score from SY 2022-2023 | Periodic Exams Science 6

		Caloocan North District III		
		MPS in SCIENCE		
SCHOOLS	GRADE 3	GRADE 4	GRADE 5	GRADE 6
A.Mabini E/S	51.25	44.04	46.87	55.47
MLQ E/S	53.68	44.91	42.01	41.01
MHDP E/S	38.37	45.75	40.58	39.16
NHC E/S	53.84	32.94	58.23	53.2
Pag-asa E/S	55.73	51.32	52.95	55.91
Pangarap E/S	41.8	42.28	45.63	43.69
Tala E/S	51.37	40.44	39.78	47.13

Moreover, the over-all MPS of the Division of Caloocan in Science for grade 3 is 55.78 (Nearly Proficient), for grade 4 is 57.15 (Nearly Proficient), for grade 5 is 59.13 (Nearly Proficient), for grade 6 is 68.59 (Nearly Proficient). The MPS also shows low performance of pupils (Table 2).

Table 2: DIVISION Over-all Mean Percentage Score from SY 2022-2023 | Periodic Exams Science

		DIVISION		
		Over-all MPS in SCIENCE		
DISTRICTS	SCIENCE 3	SCIENCE 4	SCIENCE 5	SCIENCE 6
AROMAR	60.39	53.74	51.25	51.42
POBCARAN	58.51	50.69	41.70	52.98

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VI, Issue I
August 2024
Available online at https://www.instabrightgazette.com

TANQUE	**53.88**	**49.26**	**49.82**	**54.38**
CND 1	**46.46**	**44.35**	**43.70**	**45.75**
CND 2	**55.43**	**42.65**	**44.31**	**47.16**
CND 3	**49.43**	**43.10**	**46.58**	**47.94**
CND 4	**56.40**	**49.01**	**46.79**	**50.52**
DIVISION	**55.78**	**57.15**	**59.13**	**68.59**
Proficiency Level	**Nearly Proficient**	**Nearly Proficient**	**Nearly Proficient**	**Nearly Proficient**

To tackle this issue within educational institutions, the Department of Education (DepEd) introduced the implementation of Strategic Intervention Materials (SIM) as a remedial measure to enhance the academic performance of underachieving pupils. DepEd memorandum no. 117 s. 2005, titled "Training-Workshop on Strategic Intervention Materials (SIM) for Successful Learning," paved the way for educators to create and utilize SIM within their classrooms. These materials offer tailored instructions and interventions to address the unique needs of individual pupils.

In addition to that, DepEd issued Department Order 08 s. 2015 or the Policy Guidelines on Classroom Assessment. It states that, "*There must be sufficient and appropriate instructional interventions to ensure that pupils are ready before summative tests*", and "*A learner who receives a grade below 75 in any subject in any quarter must be given intervention through remediation and extra lesson from the subject teacher/s of that student.*" This policy guideline outlines the need to arrest underachievement through giving of appropriate intervention to the pupils. It also underscores inclusive learning. As such, no pupils will be left behind as proper instructions and interventions are given to cater to individual needs.

There are many forms of intervention program for pupils to cope. It may be through remediation, modular approach, extra workloads, and many more. Espinosa (2012) summed up that the use of an instructional material plays a very significant role in enhancing the memory level of the pupils and makes the teaching – learning process interesting. DepEd has prescribed the use of Strategic Intervention Material as a remediation tool to address the least mastered concepts.

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VI, Issue I
August 2024
Available online at https://www.instabrightgazette.com

Strategic Intervention Material also known as SIM is a tool for remediation (Bunagan, 2016, Dy, 2011) that provides an opportunity for pupils to improve their academic performance (Espinosa, 2012, Dy, 2011, Togonan, 2012). It is an instructional material that motivates and creates strong impact to the learners (Espinosa et. al, 2012). It increases and deepens the student's skills in knowledge or thinking, manipulations and understanding (Togonon 2011 in Espinosa et al 2012).

This study was conceptualized to address the need for the development of E-SIM in Science for Grade 6 pupils' least mastered competencies. This study focused on understanding how the SIM for least mastered competencies for Science 6 Quarter I Week 5 – Techniques in Separating Mixtures will help pupils' mastery of concepts and the perceived effectiveness of the intervention material to the pupils. This research specifically aimed to answer the following research problems:

1. What is the level of achievement of pupils in terms of the competencies before the use of the E-SIM for least mastered competencies for Quarter I Week 5 - Techniques in Separating Mixtures?
2. Is there a significant difference in the pupils' achievement after using the E-SIM for least mastered competencies for Quarter I Week 5 - Techniques in Separating Mixtures?
3. What is the perceived effect of pupils after using the E-SIM for Quarter I Week 5 - Techniques in Separating Mixtures?

Dy (2011) defined SIM as a teaching aid used to stimulate the activity of pupils to increase the pupils' comprehension of the lesson. Bunagan (2016) also explained that it is a tool to remediate, that is, to help pupils to master least mastered competency. He further claimed that SIM should be competency based and should be easy enough for pupils to learn the topic.

The Department of Education have implemented several training programs to assist the teachers in making Strategic Intervention Materials. This will be used as supplemental teaching material aimed to lessen misconceptions and underachievement. DepEd

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VI, Issue I
August 2024
Available online at https://www.instabrightgazette.com

Memorandum No. 117 s. 2005 provided opportunity for teacher to learn how to make SIM. It provided the essential parts to make SIM attractive and self-sufficient in instructing learners to understand the concepts.

Based on the training conducted by DepEd and its Field Offices, the SIM is divided into six parts. This includes Title Card, Guide Card, Activity Card, Assessment Card, Enrichment Card, and Reference Card.

The Title Card gives the overview of the SIM. It explains the objectives and the subject matter covered which focuses on the least mastered skills. It discusses what is expected of the pupils after doing the SIM. It contains one learning competency with respect to the topic covered and two sub-tasks which the pupils will have to learn.

The next part is the Guide Card. This part presents the key concepts and skills needed to learn by the pupils. This part should arouse the interest of the pupils. Also, it must present prerequisite skills.

The Activity Card is the most essential part of the SIM. It provides learning opportunities for the pupils. The activities here should be arranged in such a way that it builds on learning experiences. Activities such as drills, puzzles, exercises, and others are presented to focus on the key concepts and skills the pupils have to learn. They should be guided to form ideas, find relationships between concepts, and discover new experiences.

The fourth is the Assessment Card. This part assesses the learning outcomes of the pupils after finishing the activity card. This may include tests such as identification, matching type, multiple choice, or open-ended questions which will allow the teacher to see the effect of the materials to the student.

The fifth part is the Enrichment Card. This provides practical activities to be done by the pupils. It gives opportunity for pupils to see the application of the concept taught in everyday life. The last part is the Reference Card. This lists different learning resources that can be used to support the instruction in the SIM.

Bunaga emphasized that in developing SIM, a careful study of the least mastered competency should be conducted. Analysis of least mastered skills will allow us to focus

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VI, Issue I
August 2024
Available online at https://www.instabrightgazette.com

resources and materials on immediate needs. Also, this will help in addressing what must be prioritized in remediation.

An examination of the Grade 6 students' performance over the past three years during the First Grading Period exposes a number of concepts with the lowest level of mastery. In this study, the term "least mastered competencies" pertains to the lessons with consistently low achievement scores in quarterly periodic tests. Table 1 provides an overview of these least mastered concepts in Grade 6.

It is evident that students exhibit limited proficiency in nearly all of the learning competencies. However, for the development of the Electronic Strategic Intervention Material (E-SIM) for students, Week 5, specifically focusing on the topic of "Techniques in Separating Mixtures," was selected.

In line with the chosen least mastered concepts and competencies, the Department of Education (DepEd) encourages teachers to create Electronic Strategic Intervention Materials (E-SIM) for their students. These E-SIMs are designed to serve as a tool for enhancing and bridging the gap between learners and the lesson.

Numerous studies have reported significant improvements when SIM is employed as a remediation tool. In their research, Salviejo, Arantes, and Espinosa (2012) investigated the impact of SIM Based Instruction (SIM-BI) on students' learning styles. They observed a substantial increase in students' performance in the topic of Chemical Bonding. Students became more motivated to learn and shifted from being surface learners to deep learners, which fostered critical thinking. Regardless of their initial learning style, SIM-BI contributed to a better understanding of concepts among the students.

Similarly, Plenos conducted a study that demonstrated a significant improvement in students' performance when using SIM. Escoreal (2012), as cited in Espinosa et al. (2012), concluded that SIM significantly reduces the students' average number of least mastered skills.

From the available literature, it is evident that the performance of students can be enhanced through the implementation of Strategic Intervention Materials. Furthermore, these

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VI, Issue I
August 2024
Available online at https://www.instabrightgazette.com

materials facilitate critical thinking and serve as a motivational tool to encourage students to learn more.

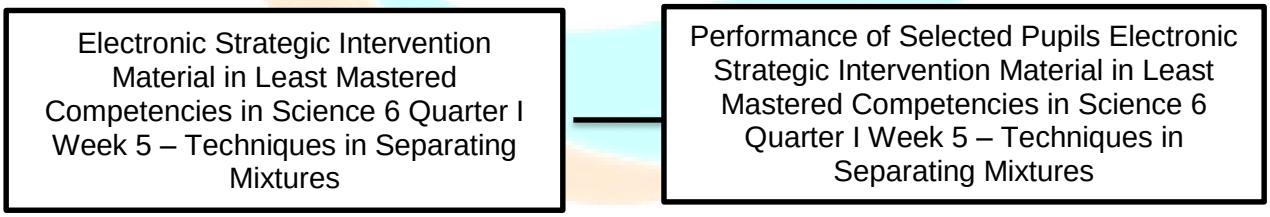
SCOPE AND DELIMITATION

This study is limited to determining the effects E-SIM on least mastered competencies in Quarter I Week 5 – Techniques in Separating Mixtures on Grade 6 SY 2024-2025 pupils of A. Mabini Elementary School. There are twenty-one (21) intact heterogeneous Grade 6 sections, with an average of 38 pupils.

Grade 6 Science teachers identified academically challenged pupils and chose 20 pupils by their performances. The E-SIM and Test Before and After the Intervention were conducted on 2024. Techniques in Separating Mixtures was the chosen topic among the list of Least Mastered Topics/Competencies.

RESEARCH PARADIGM

Figure 1 Research Paradigm



This study aims to test the E-SIM for Science 6 Quarter I – Techniques in Separating Mixtures on the performance of the Grade 6 pupils. This is illustrated above.

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VI, Issue I
August 2024
Available online at https://www.instabrightgazette.com

The research paradigm above shows the relationship between the E-SIM: "The Adventures of Anya and the Floating Island of Mixt!" and the performance of the pupils. The E-SIM is the independent variable while the performance of the pupils is the dependent variable.

RESEARCH HYPOTHESIS

Based on the problems stated above, the researchers formulated the following hypotheses.

1. The pupils did not reach "mastery level" on the Test Before the Intervention given.
2. There is no significant difference in the pupils' achievement after using the E-SIM: "The Adventures of Anya and the Floating Island of Mixt!".
3. The pupils did not like the E-SIM.
4.

RESEARCH DESIGN

The researchers adopted a descriptive-experimental design for this study. They used a quasi-experimental design known as the one-group Test Before and After the Intervention design, where a single group of students received remediation through the use of the E-SIM titled "The Adventures of Anya and the Floating Island of Mixt!" Two tests were administered and compared to assess the impact of the intervention. Additionally, a descriptive survey was conducted to gauge the perceived effect of the E-SIM on the pupils.

$$\mathbf{O_1 \quad X \quad O_2}$$

Where:

O_1 – test before the treatment/intervention

X – Treatment (E-SIM)

O_2 – test after the treatment/intervention

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VI, Issue I
August 2024
Available online at https://www.instabrightgazette.com

The teacher-researcher chose this design based on the specific problem at hand. Given that the E-SIM is intended for re-teaching purposes, as discussed by Bunagan in 2016, the teacher-researcher selected only those students who required remediation. Consequently, this study exclusively employed data collected from the experimental group.

RESEARCH RESPONDENTS

The respondents were selected from a pool of Grade 6 pupils with low achievement scores on periodic test and have failed the quiz on the least mastered topic/competencies based on the periodic test.

In this sampling technique, the name of the pooled pupils was listed on a sheet of paper and randomly drawn. Twenty sheets were drawn to form the respondent.

RESEARCH INSTRUMENTS

The researchers employed the following tools and instruments during the execution of this study: the E-SIM for Least Mastered Competencies in Science 6 Quarter I Week 5, specifically focusing on "Techniques in Separating Mixtures," and the Pupils' Test Before and After the Intervention.

The E-SIM served as the intervention material tested in this research. It was developed based on the structure of DepEd's SIM, encompassing crucial components such as the Title Card, Guide Card, Activity Card, Assessment Card, and Reference Card.

The E-SIM is titled "**The Adventures of Shenxia and the Floating Island of Mixt**"! It adheres to the essential components prescribed by DepEd in its various seminars.

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VI, Issue I
August 2024
Available online at https://www.instabrightgazette.com

The Student's Test Before and After the Intervention is a 15-item multiple-choice test to measure the achievement level of the pupils in terms of concept, comprehension, and procedure. It was faced and content-validated by the Master Teachers.

The Student's Test Before and After the Intervention in Techniques in Separating Mixtures were tested for reliability using Cronbach's Alpha with a reliability coefficient of 0.62, which falls within acceptable range. (Appendix B). The Pupils' Perception Survey (Appendix C) used is based on the SPS developed by Espinosa et. al. (2012). It is a 10-item questionnaire which aims to describe the perception of the student on the use of the E-SIM: "The Adventure of Anya and the Floating Island of Mixt!". Each statement is rated using four-choice rating scale, where 1 means strongly disagree, 2 means disagree, 3 means agree, and 4 means strongly agree.

RESEARCH METHODOLOGY

The first part of the study was the administration of the Test Before the Intervention last October 10, 2023. It was given to the pupils prior the intervention material. The 15-item Pupil's Test Before the Intervention was given to 20 pupil-respondents and the test lasted for 30 minutes.

After the Test Before the Intervention, the E-SIM was given to the respondents during the remedial classes from September 3, 2024. Every day the pupil-respondents report to the supervising teacher for monitoring. The pupils stayed for one hour after class to accomplish the E-SIM. During the monitoring, the answers to the E-SIM were checked to assess the pupils' progress. Pupils who were not able to answer the activities in the E-SIM will have to continue reading and studying the same activity until he/she is able to do so.

The next part was the administration of the Test After the Intervention to the pupils on September 6, 2024, as well as the Pupils Perception Survey (SPS) developed by Espinosa et. al (2012). A focus group discussion was conducted to validate the pupils' responses in the SPS and get feedback on the E-SIM: "The Adventure of Anya and the Floating Island of Mixt!".

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VI, Issue I
August 2024
Available online at https://www.instabrightgazette.com

The last part of the study was the checking, encoding, and analyzing of data.

STATISTICAL TREATMENT

To address the previously outlined issues, this research adopted a quantitative approach. A variety of statistical methods were employed to analyze the collected data.

The data from the Test Before and After the Intervention were subjected to mean and standard deviation analyses to illustrate score distribution and assess the extent of score variability. Gain scores were computed to measure the discrepancy between pre-test and post-test scores.

A two-tailed paired-sample test of means was employed to determine whether there exists a noteworthy difference between the pre-test and post-test data. The test analysis was conducted with a confidence level of 95%, and it involved 19 degrees of freedom. Additionally, mean, and standard deviation were utilized to characterize the pupils' responses in the Pupils' Perception Survey.

RESULT AND DISCUSSIONS

Based on the gathered data, the researchers found out the following.

Pupils' Achievement on tests Prior Intervention

The study aimed to establish the present level of the respondents in terms of their achievement in Science 6 Quarter I. Based on the Test Before the Intervention scores, the respondents have low mastery of concepts in Techniques in Separating Mixtures. Table 2 shows the frequency distribution of the scores for each item, the mean, and the standard deviation of the pupils.

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VI, Issue I
August 2024
Available online at https://www.instabrightgazette.com

Table 2: Test Before the Intervention Data

Item No.	Frequency	Percentage
1	9	0.45
2	4	0.20
3	5	0.25
4	2	0.10
5	3	0.15
6	5	0.25
7	9	0.45
8	4	0.20
9	9	0.45
10	6	0.30
11	5	0.25
12	8	0.40
13	5	0.25
14	5	0.25
15	2	0.10
Mean	**5.40**	
Std. Dev.	**2.38**	
MPS	**36.00**	

$$Gain\ Score = Test\ After - Test\ Before$$

$$Mean = \frac{Total\ Frequency}{Total\ number\ of\ items}$$

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VI, Issue I
August 2024
Available online at https://www.instabrightgazette.com

$$SD = \sqrt{\frac{\sum(X - \bar{X})^2}{N}}$$

$$MPS = \frac{Computed\ Mean}{Total\ number\ of\ items} x\ 100$$

It is evident that the students have achieved a low average score of 5.40 and a mean percentage score of 36.00. This indicates that the pupils possess a limited level of comprehension regarding the Techniques for Separating Mixtures. This could be attributed to the perception that the students find this topic more challenging when compared to other subjects. Previous tests and quizzes have consistently demonstrated that this particular topic is the one with the least mastery during the grading period.

If we look at the distribution of scores, item 2 to item 5 showed that the pupils have very limited concept of Techniques in Separating Mixtures. The percentage of correct responses tells us that the pupils found the question difficult.

Items 6 to 10 examines the pupil's comprehension of the topic with real-life and practical applications.

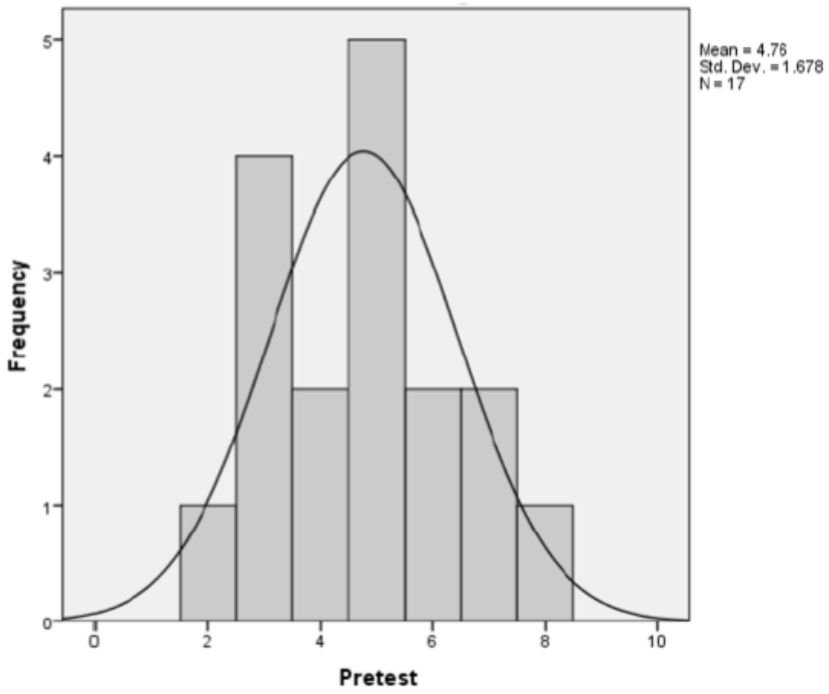
It is seen that pupils have low grasp of this concept. However, it is surprising that half of the pupils were able to answer items 7 and 9 that measures comprehension on evaporation and using kitchen materials to separate mixtures.

Items 11 to 15 measures the pupils' knowledge on the structure of setups of separating mixtures.

It is also worth noting that Figure 2 Frequency Distribution Histogram of the Respondents. It is seen that the scores do not follow the normal distribution and shows leaning to the left that indicates a positively skewed distribution. Results showed that the scores have a skewness of 0.240 with standard error of 0.550.

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VI, Issue I
August 2024
Available online at https://www.instabrightgazette.com

Figure 2: Frequency Distribution Histogram of Test Before the Intervention



A positively skewed distribution tells us that most of the pupils scored below the mean scores. This indicates that pupils have lower scores, thus, have low performance on the Test Before the Intervention.

Based on the data obtained, it can be said that the pupils showed poor performance on the Test Before the Intervention. The pupils' scores are positively skewed and requires intervention to increase the level of achievement.

Pupils' Achievement on test after the Intervention

Following the introduction of the intervention material, a post-intervention assessment, referred to as the Test After the Intervention, was administered to the students. The scores obtained were analyzed and revealed that the students' mean score after the intervention is 9.0, with a standard deviation of 2.10, reflecting an improvement compared to the pre-test

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VI, Issue I
August 2024
Available online at https://www.instabrightgazette.com

scores. Table 3 provides the frequency distribution of the scores for each item in the Test After the Intervention, along with the mean, mean percentage score, and standard deviation for this post-intervention assessment.

Table 3 Comparison between the Test Before and After the Intervention Percentage of Correct Responses, Mean, Standard Deviation, and Gain Scores

Item No.	TEST BEFORE		TEST AFTER	
	Frequency	Percentage	Frequency	Percentage
1	9	0.45	20	1.00
2	4	0.20	18	0.90
3	5	0.25	20	1.00
4	2	0.10	11	0.55
5	3	0.15	12	0.60
6	5	0.25	6	0.30
7	9	0.45	13	0.65
8	4	0.20	16	0.80
9	9	0.45	7	0.35
10	6	0.30	10	0.50
11	5	0.25	14	0.70
12	8	0.40	7	0.35
13	5	0.25	9	0.45
14	5	0.25	7	0.35
15	2	0.10	10	0.50

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VI, Issue I
August 2024
Available online at https://www.instabrightgazette.com

Mean	**5.40**	**12.00**
Std. Dev.	**2.38**	**4.74**
MPS	**36.00**	**80.0**
GAIN SCORE		**6.60**

The Test After the Intervention scores show that pupils have reached mastery over items 1, 2, 3, 8, and 11. Items 1, 2, and 3 measure conceptual knowledge of Techniques in Separating Mixtures. Items 8 and 11 measure comprehension of the topic. Items 4, 5, 7, 10, and 15 show that pupils are nearing mastery of the concept. And items 6, 12, 13, and 14 shows that pupils have low mastery of the topic being measured.

In general, the frequency of Test After the Intervention scores increased in all items as compared with the Test Before the Intervention scores after the implementation of E-SIM. In addition, a comparison of two tests items shows there is an increase in the Test After the Intervention scores as evident in the gain scores analysis.

The gain scores show the difference in the two tests scores. Also, paired-sample t-test confirms significant difference between the scores in the Pupils' tests before and after the intervention material has been given. The computed t-test value is 7.285 at 95% confidence level and degree of freedom of 19. The p-value is 0.000.

At 0.05% level of significance, the critical value for two-tailed paired-sample t-test is 1.729. The t-test value of 7.285 is way beyond the critical value, thus, indicating that there is a significant difference between the Test Before and Test After the Intervention scores of the pupils.

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VI, Issue I
August 2024
Available online at https://www.instabrightgazette.com

Table 4: T-test Table

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error	95% Confidence Lower	95% Confidence Upper			
Pair 1 Posttest – Pretest	4.50000	2.76253	.61772	3.20710	5.79290	7.285	19	.000

Espinosa (2012), Togonon (2011), and Dy (2011) support the effectiveness of using SIM for pupils' mastery of concept. As shown above, the mean scores tell us that the E-SIM helped the student to gain insights about Techniques in Separating Mixtures.

Pupils' Responses on Pupils' Perception Survey

The pupils' perception about the E-SIM: "The Adventure of Anya and the Floating Island of Mixt!" was determined using the Pupils' Perception Survey patterned from Espinosa et. al. (2012). It contains 10 statements that the pupils' rated using four-point rating scales. Table 5 summarizes the result of the survey.

Table 5: Pupils Perception Survey Summary

Statements	4	3	2	1	Mean	Interpretation
1. The E-SIM helped me understand Techniques in Separating Mixtures	17	3	0	0	3.85	Strongly Agree
2. The presentation of the concepts in the E-SIM is clear and is fitted to my needs.	14	5	4	0	3.65	Strongly Agree
3. I could easily understand the explanations provided by the e-SIM.	5	15	0	0	3.25	Agree
4. I learn some useful information not mentioned in the regular lesson after using the E-SIM.	4	13	3	0	3.05	Agree
5. The time allotment is adequate for each lesson.	20	0	0	0	4.00	Strongly Agree
6. Activities and tasks given in the E-SIM were very easy.	3	13	4	0	2.95	Agree
7. I enjoyed reading and doing all the activities provided by the E-SIM.	17	3	0	0	3.85	Strongly Agree
8. E-SIM used words and terms suited to my reading comprehension.	7	11	2	0	3.25	Strongly Agree

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VI, Issue I
August 2024
Available online at https://www.instabrightgazette.com

9. E-SIM inspired and encouraged me to learn more topics in Science.	15	4	1	0	3.70	Strongly Agree
10. I want to use E-SIM in a regular classroom teaching next time.	13	6	1	0	3.60	Strongly Agree

Based on the result, Statement 4, "The time allotment is adequate for each lesson." has the highest mean score of all the statements. This means the pupils feel that ample time was given to them to accomplish each activity in the E-SIM: "The Adventure of Anya and the Floating Island of Mixt!". This is significant as the target pupils belong to the lower group of pupils struggling with mastery of techniques of separating mixtures. This fact was clearly seen during the answering of the SPS, where each statement was interpreted for them to accurately rate each item.

The increase in time allotment in performing activities may be attributed to the difficulty in comprehending the terms, and words in the E-SIM. Responses in Statement 8, "E-SIM used words and terms suited to my reading comprehension", may provide support to this. Statement 8 has the third lowest mean score with 3.25, "Agree'. Also, Statement 6, "Activities and task given in the e-SIM were very easy." got the lowest mean score among the 10 statements. This may suggest that pupils find the E-SIM challenging, thus, it requires them more time to accomplish each task.

Nevertheless, it can be seen that pupils still enjoyed the E-SIM despite finding the material challenging. This is shown by their responses in Statement 1, "The E-SIM helped me understand the Techniques in Separating Mixtures." and Statement 7, "I enjoyed reading and doing all the activities provided in the E-SIM." with a mean score of 3.85, "Strongly Agree' concentration of solution." and Statement 7, "I enjoyed reading and doing all the activities provided in the e-SIM." with a mean score of 3.85, "Strongly Agree'.

Pupils think that the E-SIM presented the lesson clearly and is fitted to their need as reflected by their response on Statement 2, "The presentation of the concepts in the E-SIM is clear and is fitted to my needs." with a mean score of 3.65, "Strongly Agree". Also, they "Strongly Agree" that they were inspired to learn more about Science after finishing the E-SIM. This is stated in their response on Statement 9 with a mean score of 3.7.

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VI, Issue I
August 2024
Available online at https://www.instabrightgazette.com

Overall, pupils think that the e-Strategic Intervention Material for Science 6 Quarter I Week 5 – Techniques in Separating Mixtures is acceptable as shown by the mean score of 3.5, "Strongly Agree". Pupils recommends the use of E-SIM in regular classroom teaching as seen in Statement 10, "I want to use SIM in a regular classroom teaching next time.".

Pupils' responses on the SPS are supported by their comments. Table 6 shows some of the comments of the pupils in Filipino to allow them to express clearly.

Table 6: Selected Comments by pupils about the Strategic Intervention Material

"Naging masaya po kami Sir dahil may ganitong mga activities para sa mga estudyanteng katulad naming na nahuhuli sa klase. Salamat po E-SIM na ito!"
"Natuwa po ako po ako ng sobra, kasi interactive na po ang e-SIM, may salita na at nagbabasa ng mga concepts."
"Sana po ay may ganitong E-SIM sa ibang subject para mas masayang mag-aral!"
"Madali lang po pala ang lesson! Sana all!"

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VI, Issue I
August 2024
Available online at https://www.instabrightgazette.com

****

CONCLUSIONS AND RECOMMENDATIONS

The teacher-researcher, based on the data presented, concludes the following:

1. In light of this study's conclusions, pupils may choose to invest their time in acquiring educational materials that are particularly beneficial for learning science, especially in the current scenario where independent learning is essential. The utilization of E-SIM can support learners in ensuring a seamless learning process with no gaps.
2. The study's findings provide an opportunity to incorporate technology into the development of Strategic Intervention materials, offering students the best tools to support their learning journey. It's essential for E-SIM to align with the learning competencies to help students attain the expected knowledge, skills, and values.
3. The pupils' results present an opportunity to extend ongoing learning for students by offering webinars to teachers in crucial areas, enhancing their capacity to facilitate effective learning for their students.
4. Given the pupils' discovery of improved face-to-face and online student performance, teachers may explore innovative ways to develop E-SIM tailored to their selected learning competency goals. The use of E-SIM enables teachers to enhance DepEd's No Left Behind System.
5. The Department of Education can share the study's outcomes with both public and private sector teachers, introducing an innovative learning approach. These findings can also serve as valuable content for a series of webinars aimed at ensuring high-quality education for students.

In light of the study's findings and conclusions, the following recommendations are proposed:

1. Conduct additional research to explore the application of E-SIM in different subjects in order to confirm its impact on academic performance.
2. Initiate studies focused on incorporating E-SIM into standard classroom teaching to assess its suitability as an instructional tool.

****

****

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VI, Issue I
August 2024
Available online at https://www.instabrightgazette.com

****

3. Undertake research to evaluate the usability and acceptance of E-SIM among typical students across a variety of subjects.

INSTABRIGHT e-GAZETTE

ISSN: 2704-3010

Volume VI, Issue I

August 2024

Available online at https://www.instabrightgazette.com

****

APPENDICES

A1

Validation of E-SIM with our Master Teacher Lanilyn B. Mercado

INSTABRIGHT e-GAZETTE

ISSN: 2704-3010

Volume VI, Issue I

August 2024

Available online at https://www.instabrightgazette.com

****

A2

Electronic Strategic Intervention Material- The Adventures of Shenxia and the Floating Island of Mixt

****

****

INSTABRIGHT e-GAZETTE

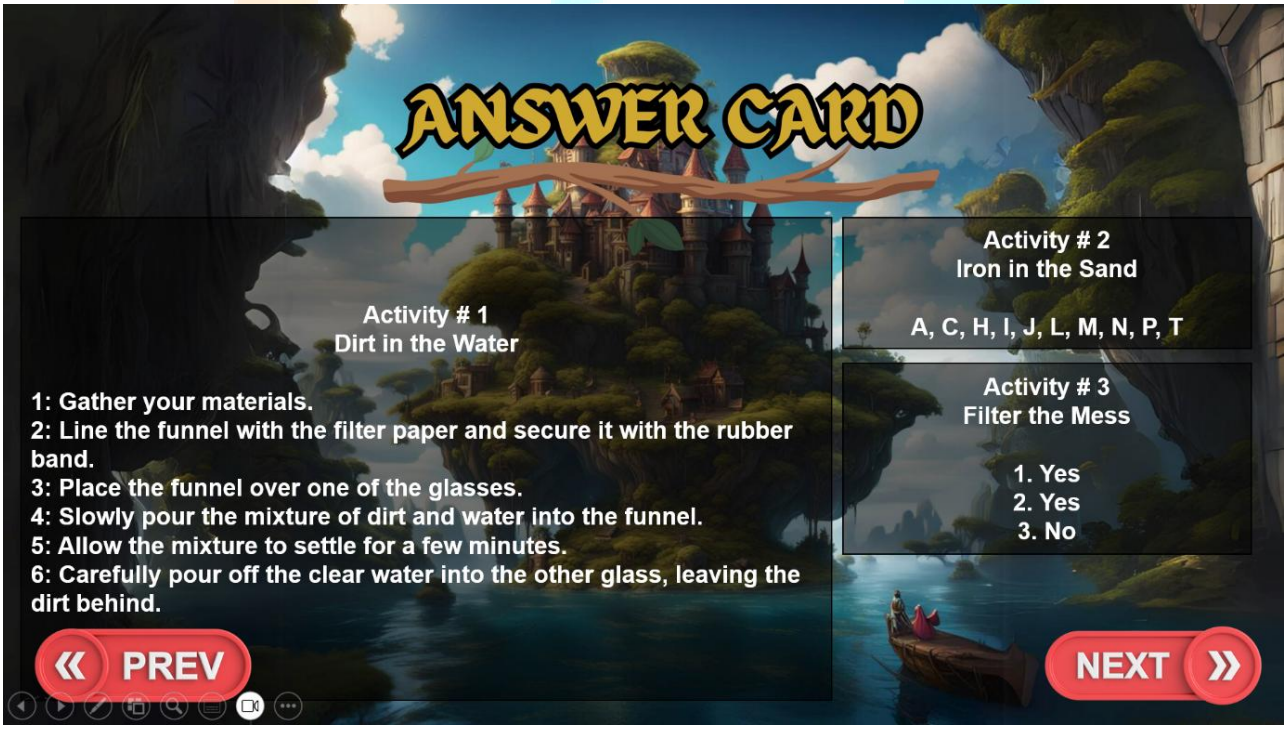
ISSN: 2704-3010

Volume VI, Issue I

August 2024

Available online at https://www.instabrightgazette.com

****



****

****

INSTABRIGHT e-GAZETTE

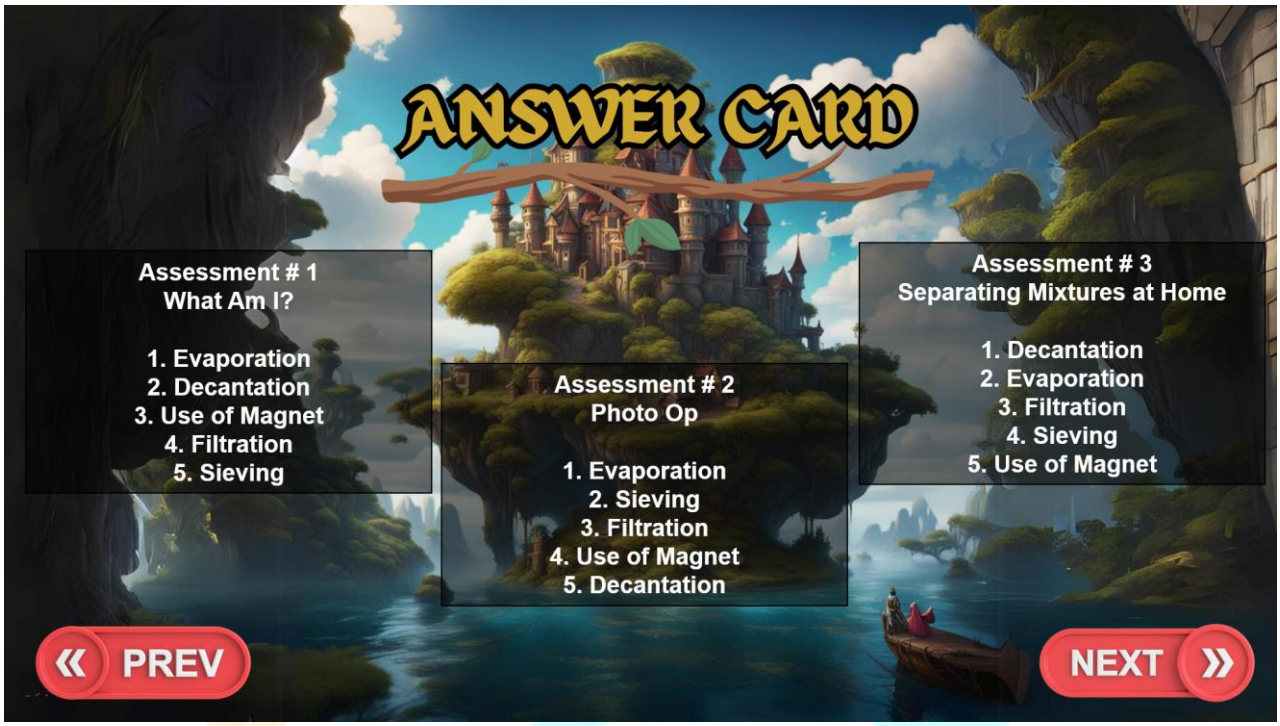
ISSN: 2704-3010

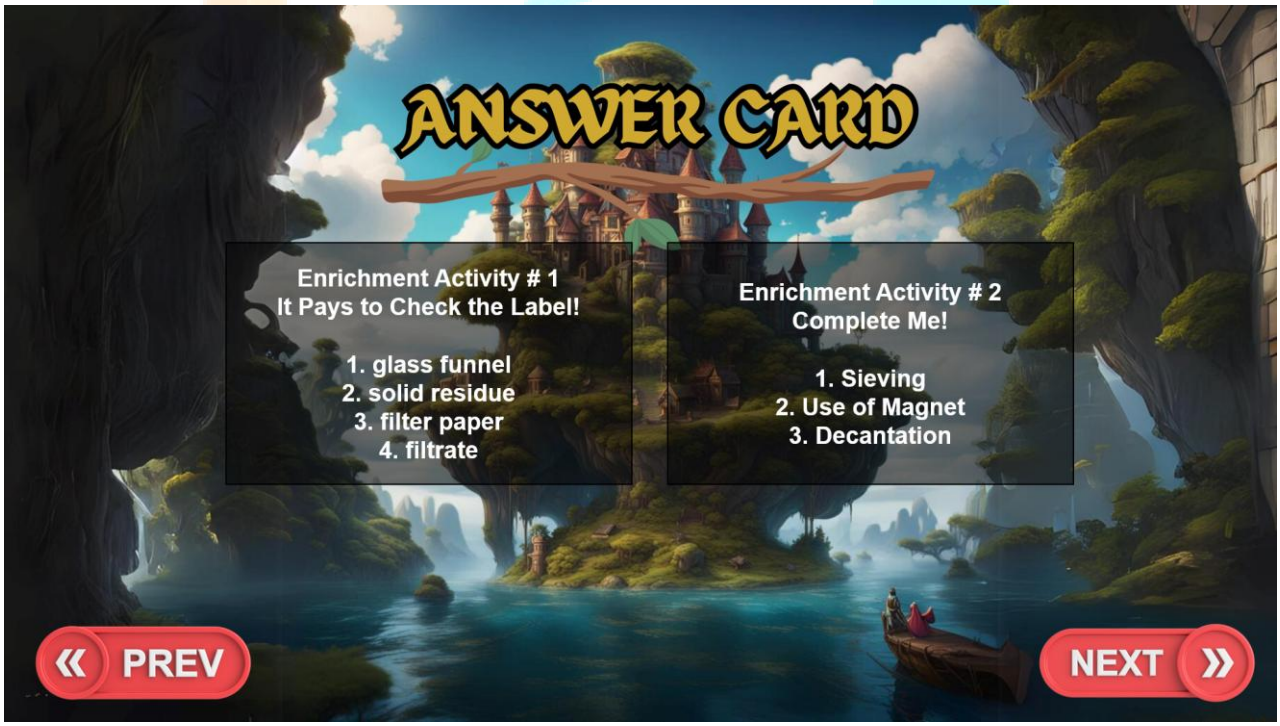
Volume VI, Issue I

August 2024

Available online at https://www.instabrightgazette.com

****





****

****

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VI, Issue I
August 2024
Available online at https://www.instabrightgazette.com

****

REFERENCES

Anadia, A J., & Membrebe, B N.(2016). Improving Student Achievement for Science in Grade Seven

Using Strategic Intervention Materials (SIM). Science Education and Teaching.

Aranda, Y A.,Diaz, R A., Sombilon, M., & Gicana, FA. (2019). Integrating strategic intervention materials (SIM) in Science to low achieving learners. Journal of Science Teachers and Educators. 2 (1).

Barredo, K. (2013). Development on the Academic Performance on Science Using Strategic Intervention

Material. Unpublished Action Research. Schools Division of Muntinlupa City. Department of Education, National Capital Region. 8.

Barredo, K. (2014). Evaluating the Effectiveness of Using Strategic Intervention Material in Improving the Academic Performance in Science Strategic Intervention Material. Unpublished Action Research.

Schools Division of Muntinlupa City. Department of Education, National Capital Region.

Bunagan, F (2012). Science Intervention Material. Retrieved from http://www.slideshare.net/felixbunagan/strategic-intervention-material

Buzzetto-More (2008). Student Perceptions of Various E-Learning Components Interdisciplinary Journal of E-Learning and Learning Objects Volume 4, 2008

Cordova, Raquel C., Medina, Janariah Grace D., Ramos, Tessa R., & Alejo, Aileen R. (2019).

Effectiveness of Competency-Based Strategic Intervention Materials in English 7. Journal of Science

Teachers and Educators 2019, 2 (1).

Cubillas, Trixie E. Usability Validation of Strategic Intervention Materials (SIMs) in Teaching Elementary English.

Dacumos, Leo Peter Narciza. Perspective of Secondary Teachers in the Utilization of Science Strategic

****

****

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VI, Issue I
August 2024
Available online at https://www.instabrightgazette.com

Intervention Material (SIM) in Increasing Learning Proficiency of Students in Science Education.

Dahar, M. (2011). Effect of the Availability and the Use of Instructional Material on Academic Performance of Students in Punjab Pakistan. Euro Journal Publishing Inc.

Dapitan, D G & Caballes, D. (2019). Exploratory Effects of Strategic Intervention Materials in General Biology 2. Biometrics and Bioinformatics,11(3), 37-41.

De Jesus R. (2019). Improving the Least Mastered Competencies in Science 9 Using "Pump It Up!"

Electronic Strategic Intervention Material Presented at the DLSU Research Congress 2019 De La Salle University, Manila, Philippines June 19 to 21, 2019

Diaz, Ernalyn D. & Dio, Ryan V., Effectiveness of Tri in 1 Strategic Intervention Materials for Grade 9 Students Through Solomon Four - Group Design, p. 79

Dy, Jocelyn O. (2007). Strategic Intervention Materials (SIM) in Teaching Science IV (Physics).

Escoreal, A. (2012), Strategic Intervention Material A Tool to Reduce Least Learned Skills in Grade Four Science.

Espinosa, A. (2012), Career – Oriented Performance Tasks: Effects on Students' Critical Thinking, Process

Skills and Interest in Chemistry. Unpublished Master 's Thesis. University of the Philippines Diliman.

Feliciano, M. (2017), A Stategic Intervention Material in Mathematics 10.

Foster L. (2015). Adults In E-Learning Environments The Psychomotor Domain. Retrieved from http://adulte-learning.weebly.com/bloomrsquos-taxonomy-and-technology-integration/thepsychomotor-domain

Garcia, Antonietta D. (2018). Strategic Intervention Materials; Its Usage and Importance.

Gultiano, Angelyn P. (2012). Effects of Strategic Intervention Material (SIM) in the Academic Achievements in Chemistry of Public High School Students.

Herrera, Fernando T. & Sorian o, Abraham T. (2016). The Efficacy of the Strategic Intervention Materials

INSTABRIGHT e-GAZETTE
ISSN: 2704-3010
Volume VI, Issue I
August 2024
Available online at https://www.instabrightgazette.com

(SIM) to the Achievement in Physics of a Selected Group of Public-School Students in Las Nieves,

Agusan Del Norte. Annals of Studies in Science and Humanities 2016 Vol 2, No 2

Hill, J. & Jordan, L. (2021). Instructional Strategies. In J. K. McDonald & R. E. West (Eds.), Design for Learning: Principles, Processes, and Praxis. EdTech Books.

Javier-Villareal, Sheila (2013). The Effectiveness of Intervention Materials in Improving Learners'

Competence in Grade 7 Students in Biology.

Lagata, G. A. (2012). Instructional leadership and school achievement: Validation of a causal model. Educational Administration Quarterly, 26, 94-125.

Lumogdang, ED. (2015). The Effects of Strategic Intervention Material in Commercial Cooking to

Students' Academic Performance in Technology and Livelihood Education. An Action Research. Korunadal National Comprehensive High School.

Olawale, S. (2013). The use of instructional materials for effective learning of Islamic studies. International Journal of Jihat al-Islam, 6, (2). Plenos, Josephine. Effectiveness of the Teacher-Made Science Strategic Intervention Material in Increasing the Performance Level of Grade Six Pupils of Bacongco Elementary Schools in the Specified Competency. Retrieved from https://www.academia.edu/9985414/Effectiveness_Of_The_Teacher_Made_Science_Strategic_Intervention_Material_In_Increasing_The_Performance_Level_Of_Grade_Six_Pupils_Of_Bacongco_Elementary_School_In_The_Specified_Competency. August 20,_2016

Salviejo, E., Aranes, F. Q., & Espinosa, A. A. (2014). Strategic intervention materials-based instruction, learning approach and pupils' performance in chemistry. International Journal of Learning, Teaching and Educational Research, 2(1), 91-123.