

ESIM (ELECTRONIC STRATEGIC INTERVENTION MATERIAL) IN SCIENCE 9: AN AID TO IMPROVE THE ONLINE LEARNING PERFORMANCE²⁸⁸

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ABSTRACT

This research utilizes ESIM (Electronic Strategic Intervention Material) to improve online learning performance in Science, assisting the goal of providing high-quality teaching and learning in the face of a pandemic. The effectiveness and acceptability of ESIM were studied in this study (Electronic Strategic Intervention Material). Its goal is to determine whether ESIM (Electronic Strategic Intervention Material) is acceptable in terms of subtasking, congruence, functionality, and replicability. It also determines the pre-and post-test performance levels of students. It also determines how much Learners value the E-SIM in terms of cognitive, emotional, and psychomotor benefits. It also examines if the learners' pre-and post-test results are significantly different. The developed ESIM targeted the least mastered skills. To describe the level of acceptability of ESIM, this study employed a descriptive research design and a quasi-experimental research design with pre-and post-tests. The purposive sample technique was utilized to gather 70 respondents, including science instructors and ICT experts, and 40 Grade-9 students. The mean and standard deviation were utilized to assess ESIM's acceptance, as well as the learners' pre-and post-test results and perceived benefits. A paired t-test was used to evaluate the significant difference between the pre-test and post-test scores. In terms of subtasking, congruence, usefulness, and replicability, data analysis demonstrated that ESIM has a very high level of acceptability. The level of learners' science proficiency improved dramatically after the material was implemented. As a result, learners' perceived cognitive, emotional, and psychomotor advantages were extremely high. There is a significant difference in learners' Science performance, as evidenced by the test difference between the pre-test and post-test. According to the study, ESIM had a significant impact on learners' performance in the subject. Based on the findings and conclusions, the developed Electronic Strategic Intervention Material (ESIM) is highly acceptable and effective in improving learners' performance.

Keywords: Electronic Strategic Intervention Material, Online Learning, Performance in Science 9

1. INTRODUCTION

Planning appropriate intervention material in scientific instruction is challenging even before the pandemic occurs. However, due to the abrupt change in learning delivery, the present situation has made things much more challenging for both teachers and students. Students encounter transitional issues as traditional face-to-face instruction gives way to online learning.

The Department of Education offered different alternative learning modalities for the students to choose what is most suitable for them. Online Distance Learning is one of those modalities under distance learning. It emphasizes the teacher as a facilitator who encourages active participation from students by utilizing various internet-based tools (Villa 2015). Online learning, according to Llego 2020, is more interactive than other methods of distance learning. Moving the mode of education online, on the other hand, is unprecedented and staggering. It challenges the flexibility of teachers in adapting to the new model of teaching. Teachers conduct intensive planning for effective strategies on how to enhance online learning outcomes since the transition affects the performance, interactivity, and experiences of the learners. These transitional challenges may pose difficulties that are not encountered when introducing the new learning system in education (Raspopovic, et al 2016).

In the new normal, many learners find learning Science to be very difficult. One of the major concerns today is the learners' incapacity or failure to comprehend particularly in the analysis, appreciate, recognize, and process the subject of the fundamentals. Educators must be equipped with creative and new tools specifically for strategies, techniques, and creative instructional materials teaching science. Therefore, integrating modern technology and interactive strategies play an important role in the effective process of online teaching and learning (Cukusic et al 2012)

The urgency to provide effective and organized strategies in teaching online specifically in science subjects is highly relevant in improving critical thinking skills and other lifelong learning competencies. The learners' needs are always changing, and teachers must accommodate even those who are labeled "left behind learners". As a result, the use of intervention materials must be considered (Marimella 2016).

As a result, the goal of this study is to see if using ESIM (Electronic Strategic Intervention Material) to improve learners' online scientific learning is acceptable and successful. The findings of this study will assist science instructors in improving their online classroom delivery methods.

1.1 Objective of the Study

The goal of this study is to see if Electronic Strategic Intervention Material (ESIM) is acceptable and effective for Grade 9 learners in Pulong Sta. National High School of Cruz,

Specifically, the study aims to:

1. Determine the level of Acceptability of ESIM (Electronic Strategic Intervention Material) in terms of:
 - 1.1 subtasking
 - 1.2 congruence
 - 1.3 functionality
 - 1.4 replicability
2. Determine the level of performance of learners in:
 - 2.1 pre-test
 - 2.2 post-test
3. Determine the level of Learners' perceived benefits of E-SIM in terms of:
 - 3.1 cognitive
 - 3.2 affective
 - 3.3 psychomotor
4. Determine whether there is a significant difference between the learners' pretest and posttest results.

2. METHODOLOGY

2.1 Research Design

The goal of this study was to determine the acceptability and effectiveness of the ESIM. In testing the acceptability of ESIM, Descriptive Research Method was used. Descriptive research incorporates gathering information to test hypotheses or answer questions about the existing state of the study's subject. Descriptive research determines and documents the present situation. Descriptive study is scientific research that methodically deals with a certain area or population and characterizes an occurrence, phenomenon, or fact. (Gay 2013)

To determine the effectiveness of the material on the learners' online learning performance, this study used the Experimental Research Method. Experimental research is used to test hypotheses and determine cause and effect correlations. The goal of experimental research is to see if a new strategy or manner of something doing is "better" than the "older" or more traditional one that has been the normal practice in the past (Tanner, 2018).

To determine the outcome of the treatment, this study used pre-test and post-test designs. Three steps are involved in the pre-test and post-test design. To measure the dependent variable, a pre-test will be given first. Second, the participants will get the experimental treatment. Third, the dependent variable was measured using a post-test. The differences ascribed to the use of the experimental treatment are as follows: The results of the pretest and post-test were then compared. (Ary et al, 2010).

2.2 Respondents of the Study

This study primarily focused on determining the acceptability and effectiveness of ESIM (Electronic Strategic Intervention Material). The learning outcomes of the students were analyzed to prove their effectiveness.

The acceptability of the ESIM (Electronic Strategic Intervention Material) was determined by 70 respondents which includes Science Teachers, and ICT Experts. On the other hand, the ESIM was utilized by 40 grade nine learners enrolled in Pulong Sta. Cruz National High School to determine its effectiveness.

The study used teacher-created Electronic Strategic Intervention Materials (ESIM) to re-teach science 9's least mastered concepts. Experts in the field of science education, including science instructors, science coordinators, and education program supervisors, validated the ESIM. In testing the acceptability of the ESIM made by the researcher, the self-made questionnaire was used. After the validation process, the ESIM was revised to ensure its effectiveness. Following the adjustments, the researcher administered a 40-item teacher-made pre-test to the respondents. The ESIM were then used for remediation, and they completed the post-test with the same questionnaire they used for the pre-test. For data analysis, each respondent's scores were used, and a complete statistical analysis was performed.

2.4 Statistical Treatment

The obtained data in this investigation was totaled, tabulated, and statistically treated. The mean and standard deviation were used to determine the level of acceptability of ESIM in terms of sub tasking, congruence, functionality, and replicability; the learners' pre-test and post-test performance in science; and the learners' perceived benefits in terms of cognitive, affective, and psychomotor. The significant difference between the pre-test and post-test scores was determined using a paired t-test.

3. RESULTS AND DISCUSSION

This chapter presents the statistical analysis of data with the corresponding interpretation and analysis of the results.

Level of Acceptability of ESIM (Electronic Strategic Intervention Material)

The following presents the level of acceptability of ESIM (Electronic Strategic Intervention Material) in terms of sub tasking, congruence, functionality, and replicability.

The respondents assessed the level of acceptability of ESIM (Electronic Strategic Intervention Material) as revealed in the following table, which shows the average mean, standard deviation, and verbal interpretation.

Table 1. Level of Acceptability of ESIM (Electronic Strategic Intervention Material) in terms of Sub Tasking

INDICATIVE STATEMENT	MEAN	SD	REMARKS
<i>In terms of sub tasking, the E-SIM...</i>			
1. is Competency-based.	4.73	0.48	Strongly Agree
2. has a content that is appropriate for the student's developmental stage	4.81	0.43	Strongly Agree
3. helps students achieve specified objectives in the subject area and grade/year level for which it is designed.	4.84	0.40	Strongly Agree
4. encourages the development of higher-order thinking abilities such as critical thinking, creativity, learning by doing, inquiry, and problem-solving.	4.84	0.40	Strongly Agree
5. helps students develop desirable values and characteristics.	4.87	0.38	Strongly Agree

Overall Mean = 4.82
Standard Deviation = 0.42
Verbal Interpretation = Very High

Table 1 illustrates the level of acceptability of ESIM (Electronic Strategic Intervention Material) in terms of Sub Tasking. As it obtained the highest mean score (M=4.87, SD=0.30), the majority of respondents strongly agreed that the ESIM promotes the development of desirable values and traits. The ESIM, according to the respondents, develops the learners' higher cognitive skills including critical thinking, creativity, learning by doing, inquiry, and problem-solving. With a mean score of (M=4.84, SD=0.40), respondents strongly agreed that the ESIM contributes to the attainment of specified objectives of the subject area and grade/year level for which it is intended. On the other side, the statement "The ESIM is Competency-based" received the lowest mean answer score (M=4.73, SD=0.38) and was marked Strongly Agree.

Overall, the level of acceptability of ESIM (Electronic Strategic Intervention Material) in terms of Sub Tasking attained a mean score of 4.82 and a standard deviation of 0.42 and was verbally interpreted

as Very High among the respondents. The result indicates that the data scores are homogeneous to each other.

The result implies that the Electronic Strategic Intervention Material is a competency-based instructional material that contributes to the achievement of the learning objective and has content that is suitable for the development of higher cognitive skills and desirable values and traits of the learners.

The study by Dacumos backs up the conclusion (2016). She looked into the experiences and perspectives of five science teachers who use strategic intervention material (SIM) in their classes, believing that it will help students improve their understanding of many difficult concepts and skills in science by promoting higher cognitive skills and autonomous learning.

Cordova and colleagues al (2019) also said that competency-based strategic intervention resources can help learners improve their performance. They discovered that when using the SIM, the students were having fun and learning. Learners were able to connect logical concepts and phrases using logical connectors. As a result, the students performed exceptionally well. Aside from that, students were able to pursue their interest in reading.

Table 2. Level of Acceptability of ESIM (Electronic Strategic Intervention Material) in terms of Congruence

INDICATIVE STATEMENT	MEAN	SD	REMARKS
<i>In terms of congruence, the E-SIM...</i>			
1. activities and tasks that are incorporated in the E-SIM are in-line with content and skills	4.84	0.37	Strongly Agree
2. the title that was significantly related to the competency being measured.	4.71	0.64	Strongly Agree
3. activities that were appropriately designed to the level of the students.	4.91	0.28	Strongly Agree
4. were designed to measure to its truest objectives paralleled to the least learned competency and sub-tasks	4.96	0.20	Strongly Agree
5. information that mainly contains the subject and is very relevant to the competency being measured	4.87	0.41	Strongly Agree

Overall Mean = 4.86
Standard Deviation = 0.42
Verbal Interpretation = Very High

Table 2 illustrates the level of acceptability of ESIM (Electronic Strategic Intervention Material) in terms of Congruence. A number of respondents strongly agreed that the intervention material was designed to test the least learned competency and sub-tasks, which gave the highest mean score (M=4.96, SD=0.20). The respondents also strongly agreed that the material has activities that were appropriately designed to the level of the students with a mean score (M=4.91, SD=0.28). The statement "the title that was significantly related to the competency being assessed" received the least responses (M=4.71, SD=0.64), yet it was rated Strongly Agree.

In general, the level of acceptability of ESIM (Electronic Strategic Intervention Material) in terms of Congruence attained a mean score of 4.86 and a standard deviation of 0.42 and was verbally interpreted as Very High among the respondents.

The result implicates that Electronic Strategic Intervention Material contains activities and tasks that are in line with content and skills and were designed to the level of the students. Moreover, it has information that mainly contains the subject and is very relevant to the competency being measured.

Bunagan's research supports this claim (2012). He says that the SIM enables learners to acquire competency-based abilities that they would not have learned in a regular classroom setting. Strategic Intervention Material is a multidimensional approach to helping students, particularly struggling students, become self-sufficient and successful learners.

A teacher's effort in producing and executing instructional materials, according to Dacumos (2015), bridges the learning gap, allowing students to achieve their educational goals, understand ideas, and master skills. When there are enough, well-designed instructional and intervention resources available for varied students, considering their learning styles, personality types, and stress-coping strategies, teaching science becomes more effective.

Table 3. Level of Acceptability of ESIM (Electronic Strategic Intervention Material) in terms of Functionality

INDICATIVE STATEMENT	MEAN	SD	REMARKS
<i>In terms of functionality, the E-SIM...</i>			
1. has the potential to stimulate the target reader's curiosity.	4.76	0.55	Strongly Agree
2. the title that is short and catchy	4.86	0.43	Strongly Agree
3. words that were simple and easily be understood by the students	4.91	0.33	Strongly Agree
4. directions that were stated and understandable to the students.	4.93	0.31	Strongly Agree
5. needed and important details that were fully discussed.	5.00	0.00	Strongly Agree

Overall Mean = 4.89
Standard Deviation = 0.38
Verbal Interpretation = Very High

Table 3 illustrates the level of acceptability of ESIM (Electronic Strategic Intervention Material) in terms of Functionality. The respondents strongly agreed that the ESIM is needed and has important details that were fully discussed. With a mean score ($M=4.93$, $SD=0.31$), they strongly agreed that the material contained directions that were clearly stated and understandable to the learners. The statement "the ability to stir the attention of the target reader," on the other hand, obtained the lowest mean score of responses ($M=4.76$, $SD=0.55$) but was also marked Strongly Agree.

Overall, the level of acceptability of ESIM (Electronic Strategic Intervention Material) in terms of Functionality attained a mean score of 4.89 and a standard deviation of 0.38 and was verbally interpreted as Very High among the respondents. The result shows that the data scores are homogeneous to each other.

Because it contains a short and catchy title, as well as terms and directions that are clear and fully addressed, the data suggests that the material has the ability to stimulate learners' interest.

This conclusion is based on a small number of investigations. According to Dalla (2014), self-learning materials should be built on a diversity of views in order to pique learners' attention and allow them to be productive in uncovering their learning on specific topics.

Dahar (2012) discovered that the effectiveness of instructional materials has a significant impact on student's academic progress. As a result, educational materials play a critical role in assisting students in improving their grades. This information has a substantial impact on learners' interest in scientific learning.

Table 4. Level of Acceptability of ESIM (Electronic Strategic Intervention Material) in terms of Replicability

INDICATIVE STATEMENT	MEAN	SD	REMARKS
<i>In terms of replicability, the E-SIM...</i>			
1. is accessible and easy to copy.	4.90	0.35	Strongly Agree
2. has been designed to work smoothly.	4.91	0.33	Strongly Agree
3. is user-focused learning material.	4.99	0.12	Strongly Agree
4. were validated before classroom use.	4.93	0.26	Strongly Agree
5. is based on least mastered learning competency.	4.90	0.30	Strongly Agree

Overall Mean = 4.93
Standard Deviation = 0.28
Verbal Interpretation = Very High

Table 4 illustrates the level of acceptability of ESIM (Electronic Strategic Intervention Material) in terms of Replicability. According to the respondents, the ESIM is user-focused learning material as it yielded the highest mean score ($M=4.99$, $SD=0.12$). With a mean score ($M=4.93$, $SD=0.26$), they strongly agreed that the intervention material was validated before classroom use. The statements "is accessible

and easy to copy" and "is based on least mastered learning competency," on the other hand, received the lowest mean score of responses (M=4.90, SD=0.35) and (M=4.90, SD=0.30), respectively, but were both marked Strongly Agree.

Overall, the level of acceptability of ESIM (Electronic Strategic Intervention Material) in terms of Replicability attained a mean score of 4.93 and a standard deviation of 0.28 and was verbally interpreted as Very High among the respondents.

The data infers that the validated material is a user-focused learning material that is accessible and has been designed to work smoothly.

Abouchacra (2021) stated that accessible instructional materials provide students with diverse ways of accessing, understanding, and engaging with content. It helps to benefit learners who require accommodations and enhances efficiency and learning in an online modality.

Level of Performance of Learners in Pre-Test and Post-test

The following presents the level of performance of learners in pre-test and post-test after the utilization of ESIM (Electronic Strategic Intervention Material). It refers to the performance in eight weeks as revealed in the following table, which shows the range, frequency, percentage, remarks, overall mean, standard deviation, and verbal interpretation.

Table 5. Level of Performance of Learners in Pre-Test and Post-test

RANGE	PRE-TEST		POSTTEST		REMARKS
	FREQUENCY	PERCENTAGE	FREQUENCY	PERCENTAGE	
41 to 50	0	0.00	9	22.50	Outstanding
31 to 40	4	10.00	22	55.00	Very Satisfactory
21 to 30	24	60.00	9	22.50	Satisfactory
11 to 20	10	25.00	0	0.00	Fairly Satisfactory
0 to 10	2	5.00	0	0.00	Did Not Meet Expectations
Total	40	100.00	40	100.00	
Overall Mean					
Standard Deviation		22.35		35.83	
Verbal Interpretation		6.19		6.86	
		Satisfactory		Very Satisfactory	

The level of performance of learners in the pre-test and post-test is shown in Table 6.

As per the pre-test, out of forty (40) students, twenty-four (24) or 60.00% of the total population gained scores between 21 to 30 which was satisfactory. Based on the result of the test, most of them answered the questions from the easy and moderate. This implies that some of the learners have prior knowledge about the lesson.

As per the post-test, out of forty (40) students, twenty-two (22) or 55.00% of the total population gained scores between 31 to 40 which was very satisfactory. Most of the learners answered easily to difficult questions. The result implies that most of the learners answered questions from all item placements after utilizing ESIM.

With a mean score of 22.35 and a standard deviation of 6.19, learners performed satisfactorily on the pretest and very satisfactory in the post-test. With a mean score of 35.83 and a standard deviation of 6.86, the posttest results were very satisfactory. As a result, the ESIM improved students' performance, as evidenced by the significantly higher mean in the posttest than in the pretest.

The findings of this study confirm the studies conducted by Villonez (2018), Herrera et. al (2016), and Dapitan et. al (2019). They used a pretest and a posttest to evaluate the Strategic Intervention Material's effectiveness. Their studies revealed found that the learners have improved performances after using the SIM.

Bunagan (2012) agreed with the findings that SIM was designed to re-teach concepts and abilities (least mastered). It is a resource provided to students to assist them in mastering competency-based abilities that they were unable to develop in a traditional classroom setting.

Level of Learners’ Perceived Benefits of E-SIM

The following presents the level of learners’ perceived benefits of E-SIM (Electronic Strategic Intervention Material) in terms of cognitive, affective, and psychomotor. It refers to the learners’ perception after utilizing the material for eight weeks as revealed in the following table, which shows the average mean, standard deviation, and verbal interpretation.

Table 6. Level of Learners’ Perceived Benefits of E-SIM in terms of Cognitive

Learners’ Perception	MEAN	SD	REMARKS
1. The E-SIM helped me understand the topics in Earth and Space.	5.00	0.00	Strongly Agree
2. I can easily analyze the presentation of concepts in the E-SIM.	5.00	0.00	Strongly Agree
3. The E-SIM made use of the words and terms which are suited to my reading comprehension.	4.90	0.30	Strongly Agree
4. I learned some useful information not mentioned in the worksheet after using the E-SIM.	4.80	0.41	Strongly Agree
5. Activities and tasks incorporated in the ESIM were clear and fit my needs.	4.83	0.45	Strongly Agree

Overall Mean = 4.91
Standard Deviation = 0.31
Verbal Interpretation = Very High

Table 6 illustrates the level of perceived benefits of ESIM in terms of Cognitive. The learners strongly agreed that the E-SIM helped them understand the topics in Earth and Space and can easily analyze the presentation of concepts in the E-SIM as it yielded the highest mean score ($M=5.00$, $SD=0.00$). With a mean score ($M=4.90$, $SD=0.30$), they believe that the E-SIM made use of the words and terms which are suited to their reading comprehension. On the other hand, the statement “I learned some useful information not mentioned in the worksheet after using the E-SIM” received the lowest mean score of responses with ($M=4.83$, $SD=0.45$) yet was also remarked Strongly Agree.

Overall, the level of perceived benefits of ESIM in terms of Cognitive attained a mean score of 4.91 and a standard deviation of 0.31 and was Very High among the respondents. This implies that E-SIM helped them understand and analyze the presentation of topics and concepts. In addition, the material made use of the words and additional information which are suited to their reading comprehension. Furthermore, the activities and tasks incorporated in the ESIM were clear and fit the learners’ needs.

Using Strategic Intervention Material, according to Lagata (2012), learners will improve their ability to recognize errors and analyze cause and effect relationships (SIM). A range of educational resources results in learning. SIM, according to Dacumos (2016), can be used as an abridgment tool to help students focus on the core concepts needed to obtain science competence.

Table 7. Level of Learners’ Perceived Benefits of E-SIM in terms of Affective

Learners’ Perception	MEAN	SD	REMARKS
1. The E-SIM inspired and encouraged me to learn more topics in science.	4.93	0.27	Strongly Agree
2. The activities and tasks integrated into the E-SIM were easy to follow.	4.78	0.53	Strongly Agree
3. I had fun reading and doing all activities required in the E-SIM.	4.95	0.22	Strongly Agree
4. I can easily relate to the presented concepts and examples in the E-SIM.	4.93	0.27	Strongly Agree
5. I am eager to use E-SIM in the online learning modality next time.	4.93	0.27	Strongly Agree

Overall Mean = 4.90
Standard Deviation = 0.33
Verbal Interpretation = Very High

Table 7 illustrates the level of perceived benefits of ESIM in terms of Affective. The learners strongly agreed that they had fun reading and doing all activities required in the E-SIM as it yielded the highest mean score ($M=4.95$, $SD=0.22$). With a mean score ($M=4.93$, $SD=0.27$) also believe that the E-SIM inspired and encouraged them to learn more topics in science. Learners can easily relate to the presented concepts and examples in the ESIM, and they are eager to use it in the online learning modality next time. On the other hand, the statement “The activities and tasks integrated into the E-SIM were easy to follow” received the lowest mean score of responses with ($M=4.78$, $SD=0.53$) yet was also remarked Strongly Agree.

Overall, the level of perceived benefits of ESIM in terms of Affective attained a mean score of 4.90 and a standard deviation of 0.33 and was Very High among the respondents. The result suggested that the E-SIM inspired and encouraged learners to read and do the activities integrated with the material.

This result is supported by a few studies. According to Togonon (2011), most learners find science concepts engaging, especially if the intervention materials are well-designed. According to Pasion (2019), SIMs are important in improving students' retention of subject content, as well as in maintaining their interest in learning and integrating the lessons into their real-life experiences as they identify with the characters they see in the videos, films, and other audio-video materials they are shown.

Table 8. Level of Learners’ Perceived Benefits of E-SIM in terms of Psychomotor

Learners’ Perception	MEAN	SD	REMARKS
1. The E-SIM was easy to manipulate.	4.88	0.40	Strongly Agree
2. I can respond smoothly because the graphic display is visually appealing.	4.90	0.30	Strongly Agree
3. I can simply react to the presented concept and example.	4.93	0.27	Strongly Agree
4. The interactive activities were easy to control.	4.88	0.40	Strongly Agree
5. I can answer and explain the provided questions.	4.90	0.30	Strongly Agree

Overall Mean = 4.90
Standard Deviation = 0.34
Verbal Interpretation = Very High

Table 8 illustrates the level of perceived benefits of ESIM in terms of Psychomotor. Learners strongly agree that they can easily react to the presented concepts and examples in the ESIM which yielded the highest mean score ($M=4.93$, $SD=0.27$. With a mean score ($M=4.90$, $SD=0.30$), the respondent strongly agreed that the material has a graphic display that is smooth and visually appealing. They can easily answer and explain the provided questions that the ESIM contains. The statements "The E-SIM was straightforward to operate" and "The interactive activities were easy to control," on the other hand, had the lowest mean score of replies ($M=4.88$, $SD=0.40$), but were both marked Strongly Agree.

Overall, the level of perceived benefits of ESIM in terms of Psychomotor attained a mean score of 4.90 and a standard deviation of 0.34 and was Very High among the respondents. The result indicates that the E-SIM was easy to manipulate and has a visually appealing graphic display. In addition, the learners enjoyed doing and answering the interactive activities.

Romano (2015) indicated in his study that learners like to have things that capture their interest. Manipulation is one activity that students enjoy doing to grasp tough concepts in science. As a result, teachers are encouraged to be as innovative as possible in order to produce a successful SIM that will help students improve their science skills.

Significant Difference between the Pre-Test and Post-test Scores of the Learners

The following data presents the significant difference between the pre-test and post-test scores of the learners. The table, shows the mean, t-statistic, critical t-value, p-value, and analysis.

Table 9. Significant Difference between the Pre-Test and Posttest Scores of the Learners

	Mean	t-statistic	Critical t value	p-value	Analysis
Pre-Test	22.35	-22.451	2.023	0.000	Significant
Posttest	35.83				

Table 9 presents the significant difference between the Pre-Test and Posttest Scores of the Learners.

There is an observed significant difference in the results of the tests for the pre and post-test. The negative t statistic implies that the scores for the post-test are greater than that of the pre-test. Furthermore, the computed t statistic of -22.451 was beyond the critical t-value of 2.023. The significance can be attributed to the p-value computed as 0.00 which is less than 0.05.

The null hypothesis "There is no significant difference between the learners' pretest and posttest scores" is rejected at the 0.05 level of significance, based on the facts above. This analysis confirmed the findings of Anadia et al. Students' academic performance was improved by employing strategic intervention materials in science's least-learned abilities, according to Aranda et al., 2016 al (2019), Sinco (2020), Lumondang (2015), Pana (2016), and Barredo (2014).

The result clearly shows a noticeable increase in the mean of the pretest after the utilization of the Electronic Strategic Intervention Material (ESIM). This is an explicit indication that the use of the developed Electronic Strategic Intervention Material (ESIM) is an effective and beneficial tool in order to improve the online learning performance of the learners in science, particularly achievement of learning competency.

CONCLUSION AND RECOMMENDATION

This study entitles "ESIM (Electronic Strategic Intervention Material) in Science 9: An Aid to Improve Online Learning Performance". The primary objective of this study is to test the acceptability and effectiveness of the material to improve the online learning performance of the learners. Based on the finding of the study, the following conclusions were drawn:

The respondents found the Electronic Strategic Intervention Material to be "Very High" in terms of subtasking, congruence, functionality, and replicability. Additionally, the learners' perceived benefits from using the ESIM in terms of Cognitive, Affective, and Psychomotor were "Very High." Furthermore, the test of the difference between the learners' pre-test and post-test results revealed a significant difference in online learning performance in science. As a result of the findings, the Electronic Strategic Intervention Material (ESIM) developed is beneficial in raising student achievement.

Based on the findings and conclusions, the following recommendations are given consideration.

1. Students may spend their time obtaining educational materials that will best assist them in learning science as a result of the conclusions of this study, especially in this new normal school where you must learn independently. The use of ESIM may aid learners in supporting their learning so that there are no gaps in the learning process.
2. The findings of the study would create an opportunity to integrate technology in developing Strategic Intervention materials. To provide the best tools that support their learning process. The ESIM should be also aligned to the learning competencies so that students may be able to acquire the expected knowledge, skills, and values expected of them.
3. The findings of the study encourage the creation of an opportunity to extend the continual learning of the students by giving webinars about the development of ESIM to the teachers in key areas which would help the learners to enhance their learning.
4. Since the study found out that there is an improvement in the online performance of the learners, the teacher may also use and find a different way in developing ESIM that can be paired with their selected learning competency targets. With the use of ESIM, teachers can improve the No Left Behind System of DepEd.
5. The Department of Education can share the result of the study with all teachers in the public and private sectors for an innovative learning approach. It can also be one of the topics worth sharing on a series of webinars in ensuring the learning quality for the students.

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