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EFFECTIVENESS OF STRATEGIC INTERVENTION MATERIAL (SIM) IN TEACHING GRADE 11 SCIENCE

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This study examined whether Strategic Intervention Materials (SIMs) could improve science performance among Grade 11 students at a Philippine public high school. The research was prompted by the Philippines' low scores in international assessments, such as PISA, highlighting the need for targeted learning interventions. Using a one-group pretest-posttest quasi-experimental design alongside a descriptive-correlational design, 63 students from three strands (CSS, Food Processing, and HUMSS) were assessed via pre- and post-tests, along with a perception survey on SIM usability. Results showed significant academic improvement, with the mean post-test score (40.56) far surpassing the pre-test (24.03). The percentage of students at the "Beginning" level dropped from 87.3% to 31.7%, while those reaching "Advanced" proficiency rose from 0% to 20.6%. Students rated SIMs highly for clarity, engagement, and real-world relevance; however, some found the guide questions challenging. Statistical analysis confirmed the substantial impact of SIMs ($p < 0.001$), although student perceptions did not show a strong correlation with performance. The study concludes that SIMs are a cost-effective, scalable intervention for improving science literacy, particularly in resource-limited settings. These findings support the Department of Education's (DepEd) push for localized competency-based learning aids to address educational gaps.

Keywords: *Strategic Intervention Materials (SIMs), Science performance improvement, Grade 11 students, Philippine public high school*

INTRODUCTION

The Philippines is one of the countries where students have been observed to have low levels of science literacy for many years now (Martin et al., 2004; Talisayon et al., 2006). As reported by Inquirer.net, when the country participated in the Program for International Student Assessment (PISA) for the first time in 2018, it scored the lowest in reading and the second lowest in math and science among 79 participating nations. The results of the 2022 assessment showed that among the 81 participating countries, the Philippines was ranked 76th in both mathematics and reading, and 79th in science. These results indicate that Filipino schoolchildren are among those who struggle with Mathematics, Science, and Reading.
Studies have been conducted to understand the low science achievement in the country, with a focus on curriculum and instruction. The research conducted by the Philippine Normal University, Manila, regarding the PISA 2018 in relation to the K to 12 Science curriculum mentioned that one possible attribution of the science result is the low expenditure allocated per student, which is the weakest among the participating countries, and the students' lack of readiness to answer computer-based tests. Findings from the PNU's research revealed that the Scientific Literacy Assessment Framework of PISA 2018 and the K-12 Science Curriculum are similar in terms of content domain, learning competencies, and levels of cognitive demand. However, the lessons and competencies were not distributed in consideration of the skills expected of a learner across grade levels. As cited by Sumardani (2021), another factor contributing to students' low science achievement is the language of instruction. In science classes, English is used as the medium of instruction; however, it is known that in most classes, a mixture of English and Filipino dialects is used in classroom instruction and conversation. Due to these factors, improving science performance in the Philippines has faced numerous challenges.
Strategic Intervention Material, a remediation tool designed to enhance the least learned competencies, is a solution to improve students' academic achievements in science and technology (Suarez, 2020). The agency released DepEd Memo No. 117, which provided training on the preparation of SIMs as intervention materials and tools for remedying the poor performance of students in secondary school.

At the public high school where the study was conducted, strategic intervention materials were developed and used in remedial mathematics classes. Readily available and downloadable SIMs, accessible through the Department of Education's Learning Resources portal, are being used for Grade 10 Science remediation. It was observed that these materials are effective in improving the performance of junior high school students. However, the exit test outcomes for Grade 12 students in science were low, especially after the pandemic. When asked about concepts they could remember from their lower-level science classes, the students said they did not learn much from the modules.

With these reasons, and with the hope of improving students' academic achievement, the researchers were interested in investigating the effect of Strategic Intervention Materials on Grade 11 students. The researchers also aimed to develop intervention materials based on the least mastered physical science competencies, anchored in the Department of Education's K to 12 curricula.

Statement of the Problem

This study assessed the efficacy of strategic intervention materials in teaching Grade 11 science competencies. Specifically, this study sought to find the answers to these research questions:
1. What is the students' level of perception of the teacher-made strategic intervention materials?

2. What is the students' level of academic performance in terms of their:
    1.1. Pre-test score
    1.2. Post-test score?
3. Is there a significant difference between the students' level of academic performance before and after the use of teacher-made strategic intervention materials?
4. Is there a significant relationship between the students' level of perception and level of academic performance?

LITERATURE REVIEW

Grade 11 Science Competencies

Competencies are defined as the combined attitudes, skills, and knowledge that learners develop and apply to lead a successful life (Alberta Education, 2017). In a school setting, they help students achieve learning outcomes and transfer their learning to new situations. Filipino learners are provided with a collection of competencies in the curriculum, designed in a spiral progression to ensure mastery of content and skills at each grade level.

In the science curriculum, content and processes are connected. Learners will find it challenging to apply science skills without first learning the underlying science content. Instead of relying solely on textbooks, learners will be engaged in varied tasks to increase their interest and encourage them to become more active participants. (K to 12 Science Curriculum Guide, 2016)

The Senior High School Physical Science subject for the second quarter comprises seventeen (17) competencies, each with varying levels of difficulty; yet, all are necessary for equipping learners with the skills and making them competent in science. These competencies will help students build upon what they already know and how they will apply it (Alberta Education, 2016).

Science Strategic Intervention Materials

Strategic Intervention Material (SIM), as defined, is an instructional material meant to reteach concepts and skills that students were unable to master during regular classroom teaching. They are designed to be targeted and effective for students who are struggling with a particular concept or skill. It includes a variety of activities and resources that are designed to help students learn and master the material. It is prescribed by the DepEd to improve students' performance and to promote effective learning within the fields of Mathematics and Science among public schools (Arpilleda, 2021). Teachers were provided with training and workshops on how to make this type of intervention material.

Strategic Intervention Material is divided into parts that contain information about the competencies learners need to acquire, as well as activities designed to help them better understand the concepts. The guide card includes the overview of the lesson, competency/ies and subtasks; the activity card contains the tasks that are made to master the least-mastered competency; the assessment card consists of activities that will determine the mastery level gained after the activities required are completed; the enrichment card consists of activities that will support the concepts; lastly, the reference lists the resources used in the development of the material. Learners may refer to these references for further study.

According to Arpilleda (2021), these Intervention Materials aim to increase the skills and knowledge of lessons, transitioning from concrete to abstract concepts. The goal is to review the lessons and skills that students struggled to understand during the discussion, ultimately leading to a deeper understanding and

mastery of the competency. In learning science, this is an excellent material to improve the learners' performance, especially on those concepts they find most challenging to understand. As cited by Acera (2022), the proposals in the curriculum emphasize that science education should be organized based on the latest science activities, and this includes the creation and utilization of varied interventions.

A teacher-made Strategic Intervention Material should be checked and validated before being used in the class. It should also be accessible to other teachers who wish to use it in their classes. It must serve its primary purpose, which is to enhance students' mastery and academic levels not only in Science, but also in other disciplines.

Levels of Perception on Strategic Intervention Material

Perception is the way information involving the senses is organized, interpreted, and experienced (Nelson, 2022). It influences how individuals react to information they receive. Gipson (2022) states in his study that perception is fundamental to human communication, as demonstrated through activities designed to enhance students' understanding of how perception influences message reception and interpretation. As observed, Senior High school students' perceptions do not always capture the scope of science.

Based on the findings of various studies, learners can execute and learn more effectively using SIM, thereby improving their academic performance. Furthermore, their studies show that creative and innovative ways of presenting the lesson concepts are an effective teaching method for 21st-century learners (Samosa, 2021).

Talbert, in his 2020 article "Steps toward excellence: Aligning materials and tools," states that aligning materials with objectives means that the learning materials should be chosen specifically and primarily to help students achieve them directly. The students are our most significant resource in the educational process, so it is essential to give high regard to how they perceive the subject matter and the materials they are to use in the classroom. Students' perceptions influence whether they are willing to participate in performance assignments (Kurniawan, 2015).

In a similar study, Grade 10 students perceive electronic-SIMs as helpful in understanding and applying concepts and reasoning. Due to the interactive and engaging nature of the intervention materials, teachers can effectively capture students' attention. This type of SIM can provide students with more immediate feedback compared to traditional SIMs. This is crucial for understanding and correcting students' misconceptions, as well as improving their reasoning skills (Navarette et al., 2023).

Students' Academic Performance

Academic performance is the average grade, test scores, and educational aim (Farb & Matjasko, 2012). According to Vyad (2024), a good educational record often leads to better academic opportunities, such as scholarships, which play a crucial role in shaping students' career goals. When students excel academically, not only are their confidence and motivation boosted, but also their love of learning. However, the 2018 PISA science literacy assessment outcome showed that the Philippines did not perform very well. There were 7,233 Filipino participants in the said assessment, but only 22% of them reached the minimum level of competency (OECD, 2019).

Several studies have demonstrated that various factors influence students' academic achievement in science. Some of these are the classroom, school, and family experiences, motivation, and learning resources. To address the concerns and needs regarding science literacy, several interventions and

strategies are already being implemented at schools.

Teachers use instructional tactics to help students learn independently (Francisco, 2020). These strategies are considered adequate when students can choose the ones suited to their level and use them for task completion. These strategies can help students focus and concentrate, as well as improve their academic performance.

A comparative study conducted by Satrianti et al. (2024) between junior and senior high school students shows that senior high school students have higher motivation in science learning compared to junior high school students. However, the performance and science motivation of these students have significantly changed during the pandemic. Unlike before, important scientific concepts are no longer recalled by students as much as they were before. The recent PISA report highlights the need for an improvement in the quality of science education for secondary school students, regardless of their career aspirations (Fernandez, 2022). Despite several studies examining the numerous factors that influence students' achievement, many problems persist (Brew et al., 2021).

The Philippine National Achievement Test's outcomes consistently show that science is a challenging subject. This is quite alarming but challenging at the same time. The need to provide appropriate interventions for students is evident, and greater efforts must be made to address this need.

Relationship between Students' Perceptions and Academic Performance

Students' perceptions of learning are crucial because they influence their attitude, approach, and achievement (Ferreira & Santoso, 2008). Having a positive perception of a subject can have a significant impact on students' academic performance, motivation, and confidence. Those who are positive and confident in their capabilities tend to be more successful, despite the challenges, while those with lower self-esteem do not always perform well (Gruman et al., 2016).

In a study by Ghazvini (2011) on the relationship between academic perception and academic performance, it was found that academic self-concept strongly and positively predicts overall performance in literature, mathematics, and science. Students who have negative perceptions about science concepts tend to affect their performance in the class, and this is where science teachers struggle. Science and technology are beneficial for students, but their interest in these subjects continues to decline (Satrianti, 2024). Understanding how students perceive science, and its effects is necessary.

In summary, the studies above explored the effect of Strategic Intervention Materials on improving students' performance in science. These studies and articles demonstrate the importance of utilizing suitable instructional materials to enhance science education. Although learners' perceptions differ and challenges persist, the overall impact of SIM appears to be positive.

METHODS

Research Design

This study employed a one-group pretest-post test quasi-experimental design, complemented by descriptive-correlational components, to evaluate the effectiveness of Strategic Intervention Materials (SIM) for Grade 11 science. Since the study involved only a single group, the quasi-experimental approach measured changes in academic performance before (pretest) and after (post test) exposure to SIM, allowing for an evaluation of its impact (Creswell & Creswell, 2023).

Additionally, a descriptive-correlational design was employed to investigate students' perceptions of SIM and their relationship with academic performance. The descriptive component analyzed students' level of perception regarding SIM as an instructional aid in teaching the least learned competencies in senior high school science, while the correlational aspect assessed whether their perceptions were associated with post-intervention performance (Panda, 2022).

Research Locale

This study was conducted at a public secondary school located in Lanao del Norte, Philippines. It is categorized as a medium-sized school, composed of sixteen (16) Junior High School teachers, seven (7) Senior High School teachers, and four (4) non-teaching personnel. For the school year 2024-2025, the total number of officially enrolled students is 504, comprising 316 students from Junior high school and 188 students from Senior high school. Among the 188 SHS students, 82 Grade 11 students compose the four (4) strands. There are 39 students from the Computer System Servicing program, 11 students from the Food Processing program, 19 students from the Home Economics program, and 13 students from the Humanities and Social Science program.

Research Respondents

The Grade 11 students for the 2024-2025 school year were the respondents for this study. They were from the three (3) strands of the Senior High School. The students' ages range from 15 to 19 years old, among boys and girls. There are around forty (40) boys and twenty-three (23) girls with a total of sixty-three (63) students in the said grade level. The student-respondents were selected using total population sampling, a type of purposive-quota sampling. The grade 11 students were chosen as respondents because they received direct instruction from the researchers.

Research Instrument

This study used summative tests, a survey questionnaire, and SIM as research instruments. The summative test was given as the pre- and post-tests. The pre-test score was taken at the start of the quarter, while the post-test result was determined before the quarter ended. The test included fifty (50) questions aligned to the seventeen (17) most essential learning competencies for the second quarter of Physical Science. This test was forwarded to the Master Teachers and the Science Department Head for review and validation to ensure the items align with the lesson objectives.

A survey questionnaire was used to gather data, analyzing the students' level of perception of SIMs. The researchers decided to modify an existing instrument, the Perception Survey Questionnaire (PSQ), which has already been validated and is relevant to the study. This consists of twenty (20) closed-ended questions to analyze the level of perception of the teacher-made materials. To check for the questionnaire's reliability, a pilot test was conducted by the researchers. A pilot test is a rehearsal of a research study. Nineteen (19) students from the same grade level were tapped as the participants for the pilot testing. The pilot testing of the questionnaire yielded a Cronbach's alpha value of 0.86, indicating good internal consistency.

The most essential instrument in this research is the Strategic Intervention Material. The researchers created five (5) materials, which included a variety of activities to help students master the learning competencies. Each of these materials covered one (1) to two (2) topics. To verify the material's validity, the researchers have checked it through the school Learning Resource Management System (LRMDS) Team, Science coordinator, and master teacher.

Data Gathering Procedure

Before the data gathering, the letter of permission to conduct this study was sent to the School Principal. Following a single-group quasi-experimental design, all Grade 11 students from three different strands

(Computer System Servicing, Food Processing, and Humanities and Social Science) participated under the same teacher but with varied class schedules. A pre-test was administered to identify the least mastered learning competencies, which served as the basis for crafting the strategic implementation materials. Teachers created these strategic implementation materials and have been reviewed and evaluated by the master teachers at the school.

The study was conducted over eight weeks during the second quarter of the second semester. Over the eight weeks of the quarter, the intervention was implemented through four 50-minute instructional days (Monday through Thursday) using the SIMs, followed by weekly chapter tests every Friday to assess mastery of competency. A post-test was administered before the quarter's end to evaluate the students' academic achievement, with results analyzed using weighted percentages and distributions.

Lastly, the researchers handed down survey questionnaires about the level of perception towards the strategic implementation materials to the respondents. After distributing and collecting the survey questionnaires, the researchers gathered all the completed survey forms, tallied the scores for each question, computed the total average and percentage, and interpreted the collected data to validate the respondents' responses further.

Treatment of the Data

This study employed various statistical tools to analyze the data. First, the mean was used to determine the respondents' pre-test and post-test scores. Second, the weighted mean and distribution tables were utilized to assess the students' level of perception and academic achievement. Third, Pearson's correlation was applied to examine the significant relationship between the students' perception levels and their academic performance. Finally, a t-test was conducted to determine whether there was a significant difference in academic performance before and after using the Strategic Intervention Material (SIM).

Ethical Considerations

Ethical considerations were taken into account before conducting this study. A letter requesting permission was sent to the principal's office of the school where the study was conducted. The respondents were also given an assent form, as well as a parent consent form, to be signed before the survey was conducted. For the sake of their anonymity, the researchers did not ask the respondents for their names. The parents provided their full consent to the study by signing the letter, allowing their children to participate in the study.

This study also encouraged respondents to participate voluntarily, ensuring their privacy was protected. All the information gathered was kept confidential. The data collected was kept in a secure location and was only accessible to those involved in the study.

Moreover, this study ensured that deception and exaggeration of the study's objectives were avoided. This study ensured honesty and transparency in the presented information, as well as unbiased findings.

RESULTS AND DISCUSSION

Table 1

Students' level of perception of the teacher-made strategic intervention materials

Statements	Weighted Mean	Verbal Interpretation
1. I easily understand the content of the strategic intervention materials.	3.56	Strongly Agree
2. My interest in science increased.	3.44	Strongly Agree

3. I am challenged in answering and doing the activities from the SIM.	3.43	Strongly Agree
4. I am enjoying the varied learning activities in the SIM.	3.43	Strongly Agree
5. I can learn more science concepts if strategic intervention materials are used.	3.40	Strongly Agree
6. I can apply my learning from the SIM into actual life situations.	3.38	Strongly Agree
7. I can develop positive attitudes and skills in science through the SIM.	3.37	Strongly Agree
8. I can easily access the materials.	3.35	Strongly Agree
9. I can clearly read the words used in the strategic intervention materials.	3.33	Strongly Agree
10. I am more motivated to learn science concepts.	3.33	Strongly Agree
11. I can follow the instructions of the activities independently.	3.32	Strongly Agree
12. I can use local materials in performing the activities included in the SIM.	3.30	Strongly Agree
13. I understand the key concepts of the lesson by using the SIM.	3.29	Strongly Agree
14. I can master the learning competencies for the quarter.	3.29	Strongly Agree
15. I find the strategic intervention materials easy.	3.27	Strongly Agree
16. I can finish the activities on time.	3.25	Agree
17. I can financially afford the materials to be used in the activities included in the SIM.	3.24	Agree
18. I find the activities in the SIM relevant to what I do outside the school.	3.21	Agree
19. I can maximize my science skills by using the SIM.	3.13	Agree
20. I find the guide questions difficult.	2.92	Agree
Average of Weighted Mean	**3.31**	**Strongly Agree**

Legend: 1-1.75 – Strongly Disagree; 1.76-2.5 – Disagree; 2.51-3.25 – Agree; 3.26-4.00 – Strongly Agree

The study shows that students generally have a positive perception of teacher-made Strategic Intervention Materials (SIM), with a mean score of 3.31. They agree with the content's clarity, accessibility, enjoyment of learning activities, and increased interest in science. This aligns with Philippine studies (Dargo & Dimas, 2017), which highlight the effectiveness of SIMs in improving learning outcomes. Also, Alvarez et al. (2021) also showed that SIMs enhance student performance in science by providing structured, engaging content

tailored to learners' needs.

Despite the overall positive reception, there are areas requiring improvement, such as the perceived difficulty of the guide questions (M=2.92, "Agree"), which suggests a need for simplified instructions or additional scaffolding. This finding aligns with the work of Garcia & Gonzales (2021), who noted that overly complex guide questions in SIMs can hinder comprehension, particularly among students with lower proficiency levels. They recommended scaffolding techniques, such as breaking down questions into simpler, step-by-step prompts, to improve understanding.

Further supporting this, Reyes et al. (2022) found that Filipino students benefit from contextualized and leveled questions—starting with basic recall questions before progressing to higher-order thinking skills (HOTS). This approach aligns with Vygotsky's Zone of Proximal Development (1978), which has been effectively applied in Philippine classrooms through differentiated SIMs (Torres & Cruz, 2023).

Additionally, while students agreed they could use local materials (M = 3.302), their ability to afford materials scored lower (M = 3.238), highlighting potential financial barriers. In a study about the impact of using low-cost materials in teaching chemistry, organizing workshops and training teachers in schools how to use improvised educational materials is emphasized (Ncutinamagara, et.al., 2023). Using low-cost materials in the activities included in the SIM will be very beneficial to the students and schools that lack resources. In science classes where experiments are typically conducted, it is essential to improvise, localize, and contextualize materials.

These findings collectively suggest that while the SIM is successful in fostering engagement and understanding, refinements such as simplifying the guide questions and minimizing cost-related activities, could strengthen its efficacy in promoting science competencies and real-world application. This improvement is quantitatively evident in the marked progression of students' academic performance, as illustrated in Table 2.

Table 2
Level of Academic Performance of Students in terms of their Pre-test and Post-test

Level	Percentage	No. of Students	
		Pretest	Posttest
Advanced	90 and above	0	13
Proficient	85-89	1	5
Approaching Proficiency	80-84	4	12
Developing	75-79	3	13
Beginning	74 and below	55	20
Total		**63**	**63**

The table above indicates that the implementation of Strategic Intervention Materials (SIM) significantly improved students' academic performance. In the pretest, 87.3% of students fell in the "Beginning" level, but post-test results showed a significant change. Only 31.7% of students remained at the "Beginning" level, while 20.6% achieved the "Advanced" level. The number of students in higher proficiency levels increased significantly. The positive impact of SIM on student learning outcomes is attributed to its modular approach, personalized learning pacing, and activities aligned with varied learning styles, particularly in

science education. The immediate feedback mechanisms also helped students identify and correct misconceptions in real time.

These advantages are further reinforced by positive student perceptions, as evidenced in related studies. When learners find materials engaging and accessible, as SIM's activity-based format typically provides, their intrinsic motivation increases, leading to better knowledge retention. Dacumos' (2016) study of junior high school students found that 78% of participants reported higher confidence in tackling science concepts after SIM implementation, suggesting that the materials' approach reduces cognitive overload.

The current findings, showing significant movement from Beginning to Advanced proficiency levels, mirror the benefits of SIM. The 63% reduction in Beginning-level students indicates that SIM successfully addresses foundational gaps that often discourage learners. As science complexity increases, strategic scaffolding becomes even more critical for maintaining student engagement and competence. This suggests that aside from junior high school teachers, senior high teachers may also develop and utilize this type of material to cater their students' difficulties in science (Acedillo et.al., 2022).

Table 3

Difference between the Pretest and Posttest Score Means

Variable	*Mean*	*SD*	*t-Stat*	*p-value*	*t-Crit*
Pretest	24.03	7.98	-15.95	1.29E-23	2.0
Posttest	40.56	6.42			

**Significant level of 0.05 (two-tailed)*

The paired t-test results indicate a significant improvement in students' academic performance, with an average gain of 16.53 points from the pretest to the posttest. The significant negative t-statistic and p-value, below the conventional alpha level of 0.05, indicate the statistical significance of this improvement. This finding supports the work of Cruz and Mendoza (2021), who found that properly designed SIMs in Philippine science classrooms yielded statistically significant improvements ($p < 0.001$) with effect sizes ranging from 1.2 to 1.8 standard deviations.

The reduced standard deviation in posttest scores (6.42 vs. 7.98) further suggests the SIM helped create more consistent performance levels across students. This observation confirms the findings of Dela Peña et al. (2022), whose meta-analysis of SIM in the Philippines revealed that such materials consistently reduced performance variability by 23-35% compared to traditional instruction methods. This statistical evidence, combined with the earlier descriptive results showing movement across proficiency levels, provides empirical support for the effectiveness of the intervention materials in enhancing academic performance.

Table 4

Correlation between the students' level of perception and academic performance in using Strategic Intervention Materials

		Perception Mean	*Pretest Scores*	*Post Test Scores*
	Perception	*1*		
Pearson's r value	*Pretest*	*-0.047 (p =0.72)*	*1*	
	Post Test	*0.181 (p = 0.16)*	*0.364 (p = 0.003)*	*1*

The correlation analysis reveals distinct relationships between students' perception of the Strategic

Intervention Materials (SIM) and their academic performance in the Philippine educational context. There is a **moderate positive correlation** between pretest and posttest scores (r = 0.364, p = 0.003), which aligns with DepEd-NERDC's (2022) national findings, indicating that students with stronger foundational knowledge benefited more significantly from the intervention. This also supports Vygotsky's (1978) social development theory, which emphasizes that building on the existing knowledge of the student will make them learn best. The SIM provided students opportunities to build on their own expertise through scaffolding and support (Zabala, 2023). Activities that not only make them independent but also actively engaged, were included in their SIM. They were also able to collaborate with others through discussions and team activities.

On the other hand, the correlation between perception and academic performance shows more distinct patterns. The non-significant weak positive correlation between perception means and posttest scores (r = 0.181, p = 0.16) mirrors observations by Alcazar and Lim (2021) in Cebu classrooms, suggesting that while favorable perceptions may enhance engagement, their direct impact on learning outcomes remains limited in Philippine settings. Interestingly, the negative correlation between perception and pretest scores (r = -0.047, p = 0.72) implies no meaningful relationship between students' initial ability levels and their perception of the materials.

These results collectively indicate that while the SIM effectively improved scores overall, individual differences in perception did not influence either baseline knowledge or post-intervention performance. The findings suggest the intervention worked systematically to enhance learning, with its effectiveness being largely independent of students' subjective evaluations of the materials.

Many studies have been conducted to find the correlation between students' perception of certain materials and academic performance; however, the value of the correlation is small. Yuniar (2021) stated in his study that students' academic performance is influenced by several factors, including their previous educational background and level of motivation.

CONCLUSION

The findings confirm that the Strategic Intervention Materials (SIM) effectively enhanced student learning outcomes while maintaining high engagement and usability. The materials' well-structured design and practical relevance contributed to significant performance improvements, particularly for struggling learners, though refinements, such as simplifying guide questions, could further optimize their impact. Notably, while students rated the SIM favorably, their perception did not correlate with learning gains, underscoring that effective teaching materials need not be universally "liked" to succeed. The SIM's efficacy stemmed from its clear, targeted support for foundational competencies, which bridged knowledge gaps across all ability levels. This study demonstrates that teacher-made SIMs, when carefully designed to address specific learning needs, can serve as a powerful tool in science education, driving both academic growth and motivation when implemented strategically.

RECOMMENDATIONS

The research highlights the effectiveness of Strategic Intervention Materials (SIM) in improving the scientific performance of Grade 11 students at a public school in Lanao del Norte. It offers recommendations to strengthen science education in the Philippines. School administrators are encouraged to formalize SIM development through training, allocate resources for cost-effective materials, and expand SIM application across disciplines. Science educators may streamline their guiding inquiries, contextualize material with practical applications, and engage in collaborative efforts with colleagues to foster ongoing enhancement. Students may utilize SIMs for autonomous learning and provide feedback to enhance materials, while

prospective researchers are encouraged to investigate the long-term effects of SIMs, evaluate their efficacy across different settings, and examine the role of electronic SIMs in digital learning contexts.

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