



Development of Digitalized Strategic Intervention Material (SIM) in Science 8 in Cabadbaran City National High School

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ABSTRACT

The study aims to develop a digitalized strategic intervention material in Science 8 to reinforce the least learned competency of Grade 8 students in the third quarter of the school year 2023-2024. The study employed a descriptive-developmental research design throughout its duration. Descriptive analysis was used to assess the least learned competency in the third quarter using a regionally validated quarterly assessment to identify the mean percentage score. The least learned competency obtained a mean percentage score of 29.9, indicating that it was not mastered. The development phase commenced with planning and designing the digitalized SIM using Microsoft PowerPoint Presentation with the touch of ClassPoint. The digitalized SIM comprised various components, including title cards, guide cards, activity cards, assessment cards, enrichment cards, reference cards, and answer key cards. The digitalized SIM underwent validation by science experts using the LRMSD tool for non-print materials as per DM No. 441 s. 2019. The Science experts scrutinized the digitalized SIM based on content quality, instructional quality, technical quality, and other findings. The validation by the science experts revealed that the digitalized SIM obtained an overall mean of 3.93 with a verbal description of very satisfactory and verbal interpretation of the passed rating and confirming its validation. Overall, the digitalized SIM is deemed correct and this will be submitted to the division LRMSD section for further quality assurance.

Keywords: Digitalized Strategic Intervention Material, Classpoint, Microsoft Powerpoint, Content Quality, Instructional Quality, Technical Quality and Other Findings

1. Introduction

In today's rapidly evolving educational landscape, the integration of digital tools and resources has become essential for enhancing student engagement and learning outcomes. Recognizing the pivotal role of technology in modern education, this study focuses on the "Development of Digitalized Strategic Intervention Material in Science 8." This research aims to create and evaluate innovative digital resources tailored to address the specific learning needs and challenges faced by eighth-grade science students. By leveraging digital platforms, we seek to provide a more interactive, accessible, and effective learning experience that not only supports the curriculum but also fosters a deeper understanding and appreciation of scientific concepts.

Science education encourages students to become active participants in global learning, emphasizing the development of essential skills like problem-solving, research capabilities, and a deep understanding of science. Grade 8 students find themselves at a crucial point in their learning journey. This stage marks a transition in science education towards more specialized subjects. During this time, the development of their reasoning skills, scientific thinking, and inquiry abilities become the cornerstone for building a solid foundation in scientific knowledge (Gara, 2023).

The student generation is heavily reliant on technology in their lives, utilizing it for information access, collaboration, communication, and creativity. However, technology also presents challenges like digital distractions and information overload. To address these, educators must create instructional materials that integrate technology seamlessly, catering to diverse learning styles. These materials should enhance understanding, retention, critical thinking, creativity, and digital literacy skills. By incorporating technology, educators can better prepare students for the 21st century's challenges and equip them with the necessary digital skills (Hero, 2019).

However, with the vast transition of the learning modalities, Science 8 was reformed to 4 learning areas that the students need to be equipped in the spiral progression approach such as physics, earth and space, chemistry and biology.

The K to 12 science curriculum aims to develop students into scientifically, technologically, and environmentally literate citizens. It uses approaches like multi/interdisciplinary, contextual, problem/issue-based, and inquiry-based learning. The curriculum integrates science and technology in everyday life, teaching topics like Laws of Motion and the role of matter in the solar system (Jabello, 2021).

Students had difficulties in learning due to the transition of learning areas in every quarter that is why teachers are encouraged to craft learning materials that are the primary resources of lesson materials that teachers can use to teach.

These are organized to support classroom instruction, such as textbooks, tasks, and supplementary resources. It enables teachers to offer interactive, interesting, and engaging learning activities under in the provisions of DepEd Order 35, s. 1988. It also helps students learn new concepts, provides practice opportunities, and improves and promotes teaching and learning activities for the holistic development of the learners (Inocencio & Calimlim, 2021).

However, with the fast growing of modern technologies, new trends in the medium of instruction emerge in the educational society using digitalization of the materials to be used by the learners. Manalastas (2020) emphasized that the used of digital instructional materials will help the teachers and the learners to propagate in the teaching-learning process.

However, the Program for International Student Assessment (PISA 2018) revealed that students in the country scored significantly lower than the OECD average of 489 points in Scientific Literacy. Female students scored 359 points, while private school students scored 399 points. SHS students scored 439 points better than JHS students. The National Capital Region (NCR) had the highest scores across all administrative regions. These students can creatively and autonomously apply their knowledge of and about science to a wide variety of situations, including unfamiliar ones.

In addition, the Program for International Student Assessment (PISA 2021) also scores revealed that Science ranks third lowest and down to -1 compared to 2018. Students in the Philippines scored less than the OECD average in mathematics, reading, and science almost no students were top performers in science, meaning that they were proficient at Level 5 or 6 (OECD average: 7%). The Department is implementing reforms in four key areas: upskilling teachers and school leaders, reviewing and updating curriculum, improving the learning environment, and fostering multi-stakeholder cooperation.

On the other hand, DepEd reported that public high school performance has declined, with the average NAT score falling to 48.9% between 2011 and 2012. This problem has gotten worse because of the COVID-19 epidemic (Dizon et.al, 2021). According to Ariaso (2020), pedagogical strategies, as well as the qualities of teachers and students, have an impact on student accomplishment.

However, data were shown in the division-wide test results from 2020-2020 revealed a drastic mean percentage scores from the Grade 8 students in Cabadbaran City Division. In 2020, it was revealed that the overall MPS from quarter 1 to 4 got 47.54 due to the covid-19 pandemic. Similarly, in 2021 an MPS score of 48.67 was noted due to the sudden shift of learning modality. Likewise, in 2022, the overall MPS score in the whole division got 48.43 was evident due to the shift of face-to-face classes as mandated by the Department of Education. With this division-wide MPS results there is a need to address this issues by developing instructional materials and teaching strategies that will help the learners to improve their academic performance.

In connection to this, based on school-based data records in Cabadbaran City National High School, the mean percentage core of the Grade 8 students revealed a drop in the MPS score. In 2020–2021, the overall MPS was 64.10%,

which was interpreted as nearly mastered. Meanwhile, in 2021–2022, it was revealed that there was a sudden drop in the student's performance, who got an overall MPS of 60.26%, which could be interpreted as nearly mastered. Furthermore, in the school year 2022-2023, it was observed that the overall MPS score of the Grade 8 students decreased by 57.38%. This denotes that there is a need for reforms by the teachers in the delivery of instruction and in the development of instructional materials that will help the students improve their performance.

With the abovementioned deficiencies, the Department of Education conducted training workshops on strategic interventions for successful learning as mandated by DepEd Memorandum 2005, No. 117 to train teachers in developing various intervention materials for remediation and enrichment of learning. The development of strategic instructional material (SIM) is one of the measures that will achieve one of the primary goals of the Department of Education that no child is left behind which will provide every student the opportunity to improve their school performance and master their least learned skills not only in Science but in all subject areas.

With this, there is a need to develop a digitalized instructional materials to capacitate and help the Grade 8 learners in Science to improve their least learned skills. The study aimed to developed a digitalized strategic intervention material (SIM) in Science 8 to enhance the academic performance among Grade 8 students in Cabadbaran City National High School.

1.1 Statement of the Problem

The study aimed to developed a digitalized strategic intervention material in Science 8 at Cabadbaran City National High School.

Specifically, it sought to answer the following questions.

1. What were the least mastered competencies in Science 8 based on the 3rd quarter test results?
2. Based on the least mastered competencies in Science 8, what digitalized strategic intervention material in Science can be developed?
3. How valid was the digitalized strategic intervention material as evaluated by the Science experts based on the LRMDs Assessment and Evaluation tool in terms of:
 - 3.1 content quality
 - 3.2 instructional quality
 - 3.3 technical quality

3.4 other findings

4. Based on the findings of the study, what enhancement of the digitalized strategic intervention material (SIM) can be recommended?

2. Methodology

2.1 Research Design

The study used descriptive-developmental design. It was descriptive because it presented the least learned competencies in Science 8 that will provide a better understanding of crafting instructional material in Science 8. Analyzing and reviewing the digitalized strategic intervention material which consisted of the Division Science Supervisor, one master teacher in science, and one grade 8 science teacher.

It was developmental research because it developed a digitalized strategic intervention instructional. The most common types of developmental research involve situations in which the product-development process was analyzed, compared, and described, as the final product.

2.2 Respondents

The respondents of the study were the 113 from the 3 sections of Grade 8 students in Cabadbaran City National High School who are presently enrolled this school year 2023 – 2024 and they would all be taken as respondents purposively. The specialists in the Science area will validate the digitalized strategic intervention material based on the criteria of the Learning Resources Management and Development System (LRMDS) Form.

2.3 Research Locale

This research was conducted at Cabadbaran City National High School- Junior High School Cabadbaran City, Agusan del Norte. Cabadbaran City National High School is an empowered school in Cabadbaran City Division wherein it offers junior high school, science and technology, and engineering programs and senior high school where education is at its best. The school was located in Barangay 12, Cabadbaran City. The school was composed of 87 teachers in junior high school and 50 in senior high school. The total population of the students in the school was composed of 2432 junior high school and 1940 senior high school. Moreover, the science teachers in the school were composed of 12 and 653 Grade 8 students.

2.4 Research Instrument

The regional standardized test was used to measure the least learned competencies in Science 8. The Learning Resources Management and Development System (LRMDS) will be used to validate the developed manipulative strategic intervention material (SIM).

Table 2 presented the DepEd-mandated measurement of mean percentage score.

Table 2 . *Mean Percentage Score (MPS)*

MPS	Mastery Level
75 and above	Mastered
51-74	Nearly Mastered
50 and below	Not Mastered

Note. Department of Education MPS interpretation cited by Chua, 2021

Table 3 presented the measurement of the evaluation and assessment of the SIM as to the content, instructional, technical and other findings.

Table 3. *Rating Score in Validation in SIM in content quality*

Scoring	Measure	Description	Interpretation
4	Resource must score	Very Satisfactory	Passed
3	at least 30 points	Satisfactory	Passed
2	out of 40 points	Poor	Failed
1	pass the criterion.	Not Satisfactory	Failed

Rating Score in Validation in SIM in instructional quality

Scoring	Measure	Description	Interpretation
4	Resource must score	Very Satisfactory	Passed
3	at least 30 points	Satisfactory	Passed
2	out of 40 points	Poor	Failed
1	pass the criterion.	Not Satisfactory	Failed

Rating Score in Validation in SIM in technical quality

Scoring	Measure	Description	Interpretation
4	Resource must score	Very Satisfactory	Passed
3	at least 39 points	Satisfactory	Passed
2	out of 52 points	Poor	Failed
1	pass the criterion.	Not Satisfactory	Failed

Rating Score in Validation in SIM in other findings

Scoring	Measure	Description	Interpretation
4	Resource must score	Very Satisfactory	Passed
3	at least 16 points	Satisfactory	Failed
2	out of 16 points	Poor	Failed
1	pass the criterion.	Not Satisfactory	Failed

These measurements were derived from the evaluation and rating sheet of non-printed material/ resources as indicated in the guiding principle of DM No. 441, s. 2019 Guidelines and Process for LRMDs Assessment and Evaluation of Locally Developed and Procured Materials.

2.5 Statistical Treatment

The following statistical tools was used in the analysis and interpretation of data.

Mean Percentage Score. It was used to determine the least mastered/ learned competency of Grade 8 students in science.

3. RESULTS AND DISCUSSION

The data collected from the respondents are presented, analyzed, and interpreted in this chapter.

Problem 1. What are the least mastered competencies in Science 8 based on the 3rd quarter test results?

Based on the data presented below, table 4 of learning competency in science 8 and the number of items, percentage and the level of mastery score of the students who did get the passing MPS in column 4 in science 8 quarter 3 S.Y. 2023-2024.

Table 4. Mastery Level of Learning Competencies Tested in Science 8

No.	Learning Competencies	Number of items	# of students got the correct answer	Average number of examinees	Percent	Level of Mastery
1	Explain the properties of solids, liquids, and gases based on the particle nature of matter. S8MT-IIIa-b-8.	1-13	586	45.08	29.9%	Not Mastered
2	Explain physical changes in terms of the arrangement and	14-26	1,134	87.23	57.8%	Nearly Mastered

	motion of atoms and molecules; S8MT-IIIc-d-9					
3	Determine the number of protons, neutrons, and electrons in a particular atom; S8MT-IIIe-f-10	27-18	981	81.75	54.1%	Nearly Mastered
4	Use the periodic table to predict the chemical behavior of an element. S8MT-IIIi-j-12	39-50	1,024	85.33	56.5%	Nearly Mastered

The assessment results for the Mastery Level of Learning Competencies in Science 8 reveal a mixed picture of student understanding across various topics. While a significant portion of students demonstrated nearly proficiency in explaining physical changes in terms of atomic and molecular motion and determining the structure of atoms, with percentages ranging from 54.1% to 57.8%, there are notable areas of concern. For instance, only 29.9% of students not mastered the explanation of properties of solids, liquids, and gases based on the particle nature of matter. This suggests a need for targeted interventions and instructional strategies to bolster comprehension in this foundational concept. Additionally, while the majority of students showed proficiency in using the periodic table to predict chemical behavior, there remains room for improvement, particularly in reinforcing understanding of atomic structure and its implications. These findings underscore the importance of ongoing assessment and differentiated instruction to address gaps in knowledge and ensure all students attain mastery in essential science concepts.

Table 5. Mean Percentage Score of Grade 8 Students in Science 8

No.	MELS in Science 8	MPS	Level of Mastery
1	Explain the properties of solids, liquids, and gases based on the particle nature of matter. S8MT-IIIa-b-8	29.9	Not Mastered
2	Explain physical changes in terms of the arrangement and motion of atoms and molecules; S8MT-IIIc-d-9	57.8	Nearly Mastered
3	Determine the number of protons, neutrons, and electrons in a particular atom; S8MT-IIIe-f-10	54.1	Nearly Mastered
4	Use the periodic table to predict the chemical behavior of an element. S8MT-IIIi-j-12	56.5	Nearly Mastered

Among the four most essential learning competencies in Science 8 for the third quarter, the competency "Explain the properties of solids, liquids, and gases based on the particle nature of matter" (S8MT-IIIa-b-8) garnered only a 29.9 percent mean percentage score. This low score indicates that it is the least mastered competency. In response to this significant gap in understanding, the researcher designed and developed a digitalized strategic intervention material (SIM) specifically targeting this competency. The aim of the SIM is to assist in addressing the least-mastered competencies and to enhance the conceptual knowledge of students. By leveraging digital tools, the intervention material encourages meaningful learning through interactive and engaging content. Furthermore, this digitalized approach can be continuously improved by incorporating additional elements and expanding to cover more topic areas, ensuring a comprehensive and adaptable resource that can effectively support students in mastering fundamental scientific concepts.

Problem 2. Based on the least learned competencies in Science 8, what digitalized strategic intervention material in Science can be developed?

The development of a digitalized Strategic Intervention Material (SIM) in Science 8 will focus on addressing the least learned competency among students. This digital SIM will feature a unique and engaging component: a virtual tour of the beautiful spots in Cabadbaran City. This innovative approach aims to enhance student engagement and learning outcomes by incorporating local attractions into the educational experience. The digitalized SIM is structured into several key parts, as outlined by Arevalo, Janer, and Ricafort (2023). These components include a Title Card, which introduces the material, a Guide Card to direct the learning process, an Activity Card that provides interactive tasks, an Assessment Card to evaluate student understanding, an Enrichment Card offering additional resources for deeper learning, a Reference Card for citing sources, and an Answer Key Card for self-assessment. This comprehensive structure ensures that the digitalized SIM is both thorough and accessible. Students and educators can access this digitalized learning tool through a provided Google link, making it convenient and easy to integrate into the classroom.

https://docs.google.com/presentation/d/1NkVA58gkgJ5YQ37_sjxZ357Zu_hIEGoD/edit?usp=drive_link&ouid=110191566735845656023&rtfpof=true&sd=true

Problem 3. How valid is the digitalized strategic intervention material as evaluated by the Science experts based on the LRMS Assessment and Evaluation tool in terms of:

The digitalized Strategic Intervention Material (SIM) in Science 8 has been meticulously crafted to target and reinforce the least learned competencies of Grade 8 students. Central to its design is a captivating virtual tour showcasing the renowned landmarks and attractions of Cabadbaran City. This innovative approach not only aligns with the specific needs of the learners but also capitalizes on the power of experiential learning to enhance engagement and comprehension.

Table 6 presents the validator's rating according to the factor of content quality of the digitalized SIM.

Table 6

Validator's rating according to Factor A (content quality)

Indicators	Score	Description	Interpretation
1. Content is consistent with topics/skills found in the DepEd Learning Competencies for the subject and grade/year level it was intended.	4	Very Satisfactory	Passed
2. Concepts developed contribute to enrichment, reinforcement, or mastery of the identified learning objectives.	4	Very Satisfactory	Passed
3. Content is accurate.	4	Very Satisfactory	Passed
4. Content is up-to-date.	4	Very Satisfactory	Passed
5. Content is logically developed and organized.	4	Very Satisfactory	Passed
6. Content is free from cultural, gender, racial, or ethnic bias.	4	Very Satisfactory	Passed
7. Content stimulates and promotes critical thinking.	4	Very Satisfactory	Passed
8. Content is relevant to real-life situations.	4	Very Satisfactory	Passed
9. Language (including vocabulary) is appropriate to the target user level.	4	Very Satisfactory	Passed
10. Content promotes positive values that support formative growth.	4	Very Satisfactory	Passed
Total Points	40	Very Satisfactory	Passed

The validator's rating for Factor A, which assesses the content quality of the digitalized Strategic Intervention Material (SIM) in Science 8, reveals an exemplary performance across all indicators. With a perfect score of 4 for each criterion, with a total of 40 points which verbal description of very satisfactory and verbal interpretation of passed the SIM has demonstrated exceptional alignment with the DepEd Learning Competencies, ensuring that the content is consistent with the intended grade level and subject matter.

Moreover, the concepts developed within the SIM contribute significantly to the enrichment, reinforcement, and mastery of the identified learning objectives, indicating a robust educational framework. The content is not only accurate and up-to-date but also logically organized, free from bias, and stimulating critical thinking among students.

Based on the assessment of the validators, the content of SIM stimulates learning for the students. It develops their higher-order skills and indicates a positive outlook on learning. The validators emphasized that all of the activities in the digitalized SIM are anchored to the policy guidelines of the Department of Education.

In addition according to Cabiad (2019) the experiences of seventh-grade students with contextualized science educational resources. Using the students' narrative experiences and pre-test results, a mixed quantitative and qualitative research design was employed. The contextualized teaching resources were developed as a learner intervention to strengthen the Science 7 least-practiced competency skills.

Table 7 presents the validator's rating according to instructional quality of the digitalized SIM of science 8.

Table 7. Validator's rating according to Factor B (instructional quality)

Indicators	Score	Description	Interpretation
1. Purpose of the material is well defined.	4	Very Satisfactory	Passed
2. Material achieves its defined purpose	4	Very Satisfactory	Passed
3. Learning objectives are clearly stated and measurable.	4	Very Satisfactory	Passed

4.	Level of difficulty is appropriate for the intended target user.	4	Very Satisfactory	Passed
5.	Graphics / colors / sounds are used for appropriate instructional reasons.	3.67	Very Satisfactory	Passed
6.	Material is enjoyable, stimulating, challenging, and engaging.	4	Very Satisfactory	Passed
7.	Material effectively stimulates creativity of target user.	3.67	Very Satisfactory	Passed
8.	Feedback on target user's responses is effectively employed.	3.67	Very Satisfactory	Passed
9.	Target user can control the rate and sequence of presentation and review.	4	Very Satisfactory	Passed
10.	Instruction is integrated with target user's previous experience.	4	Very Satisfactory	Passed
Total Points		39.01	Very Satisfactory	Passed

The validator's rating for Factor B, which assesses the instructional quality of the digitalized Strategic Intervention Material (SIM) in Science 8, highlights a commendable performance across all indicators. It was observed that item 5, graphics / colors / sounds are used for appropriate instructional reasons, item 7, material effectively stimulates creativity of target user and item 8, feedback on target user's responses is effectively employed, got the lowest score of 3.67 points from the validators. This denotes that the digitalized SIM needs to be polished based on the observations from the validators. It's noted that graphics, colors, and sounds could benefit from a more consistent and purposeful application, as highlighted by validator 2's observation of distracting elements. Similarly, validator 1 emphasized the importance of linguistic consistency within the SIM's content, indicating a need for revisions to enhance clarity and coherence.

Conversely, item 1, 2, 3, 4, 6, 9 and 10 got the perfect score of 4 points which verbal description of very satisfactory and verbal interpretation of passed. The material demonstrates a clear and well-defined purpose, effectively achieving its defined objectives while ensuring that learning goals are explicitly stated and measurable. Additionally, the level of difficulty is deemed appropriate for the target users, contributing to an engaging and stimulating learning experience. Validators commended the material's ability to appropriately challenge and stimulate students while facilitating their mastery of scientific concepts through engaging activities.

The study examines the effectiveness of competency-based strategic intervention materials in English for Grade 7 learners. The authors found poor pretest mean scores, prompting the development of these materials. The study used purposive sampling and z-test to analyze the results. The results showed a significant difference in the assessment of the competency-based SIM, with learners enjoying and improving their least mastered skills. They also developed a passion for reading and improved their ability to combine logical ideas and sentences (Cordova et.al, 2019).

Furthermore, with the total score of 39.01 points which connotes a verbal description of very satisfactory and verbal interpretation of passed. This reflects the SIM's success in delivering high-quality instructional content that effectively supports learning objectives and engages Grade 8 students in Science.

Table 8 presents the validator's rating according to the technical quality of the digitalized SIM.

Table 8. *Validator's rating according to Factor C (technical quality)*

Indicators	Score	Description	Interpretation
1. Audio enhances understanding of the concept.	4	Very Satisfactory	Passed
2. Speech and narration (correct pacing, intonation, and pronunciation) is clear and can be easily understood.	3.67	Very Satisfactory	Passed
3. There is complete synchronization of audio with the visuals, if any.	3.33	Very Satisfactory	Passed
4. Music and sound effects are appropriate and effective for instructional purposes.	3.67	Very Satisfactory	Passed
5. Screen displays (text) are uncluttered, easy to read, and aesthetically pleasing.	3.67	Very Satisfactory	Passed
6. Visual presentations (non-text) are clear and easy to interpret.	4	Very Satisfactory	Passed

7.	Visuals sustain interest and do not distract user's attention.	3.67	Very Satisfactory	Passed
8.	Visuals provide accurate representation of the concept discussed.	4	Very Satisfactory	Passed
9.	The user support materials (if any) are effective.	4	Very Satisfactory	Passed
10.	The design allows the target user to navigate freely through the material.	3.67	Very Satisfactory	Passed
11.	The material can easily and independently be used.	3.67	Very Satisfactory	Passed
12.	The material will run using minimum system requirements.	4	Very Satisfactory	Passed
13.	The program is free from technical problems.	4	Very Satisfactory	Passed
Total Points		49.35	Very Satisfactory	Passed

Table 8 presents the validator's rating in technical quality of the digitalized SIM in science 8. Based from the validator's critiques, it was observed that item 3, there is complete synchronization of audio with the visuals, if any got the lowest score of 3.33 which connotes a verbal description of very satisfactory and verbal interpretation of passed. This denotes that there are minor technical glitches in the digitalized SIM that needs improvement. Validators noted instances of inconsistency in audio-visual synchronization, highlighting the need for refinement to ensure a seamless learning experience. Validator 2's observation of a hyperlink mistake in the answer key card further underscores the importance of meticulous attention to detail in technical aspects. Similarly, validator 3 emphasized the necessity of using voice localization and maintaining consistent audio quality throughout the SIM.

Conversely, it was observed in items 1, 6, 8, 9, 12, and 13 which denotes a perfect score of 4 which connotes a verbal description of very satisfactory and verbal interpretation of passed. This denotes that the audio and visual presentation in the digitalized SIM promotes understanding to the concepts of the instructional material. Validators praised the effectiveness of the digitalized SIM, particularly its use of PowerPoint Presentation, which facilitates ease of use and accessibility even without an internet connection. Moreover, validators appreciated the material's ability to run on minimum system requirements, ensuring compatibility and user-friendliness for students.

Furthermore, with the total score of 49.35 points which underscores a verbal description of very satisfactory and verbal interpretation of passed. Overall, while the digitalized SIM demonstrates strong technical capabilities, there are opportunities for enhancement in audio-visual synchronization and localization. Nonetheless, its effectiveness in promoting understanding and accessibility underscores its value as a powerful educational tool for Grade 8 Science students. Moving forward, addressing the identified technical issues will further elevate the SIM's quality and effectiveness in facilitating student learning and engagement.

Moreover, Ruz and Schunn (2018) reveals that girls' competency beliefs are crucial for science content learning during middle school, and how these beliefs are mediated by both in and out-of-school factors. The research involved 2,900 6th and 8th grade students from two US regions. Results showed that as boys grow older, their willingness to engage in argumentation and participate in science experiences suppresses the role of competency beliefs on learning science content. However, as girls grow older, they show an increasing need for high competency beliefs to achieve strong content learning gains. This suggests that girls need more support to access the benefits of these experiences.

Table 9 presents the validator's rating on the other findings of the digitalized SIM in science 8.

Table 9. Validator's rating according to Factor D (other findings)

Indicators	Score	Description	Interpretation
1. No conceptual errors.	4	Very Satisfactory	Passed
2. No factual errors.	4	Very Satisfactory	Passed
3. No grammatical and / or typographical errors.	4	Very Satisfactory	Passed
4. No other errors (i.e., computational errors, obsolete information, errors in the visuals, etc.).	4	Very Satisfactory	Passed
Total Points	16	Very Satisfactory	Passed

The validator's rating for Factor D, which assesses other findings related to the digitalized Strategic Intervention Material (SIM) in Science 8, demonstrates an exceptional performance across all indicators. With a perfect score of 4 for each criterion, which denotes a verbal description of very satisfactory and verbal interpretation of passed, the SIM indicates the absence of conceptual errors, factual errors, grammatical or typographical errors, as well as other errors such as computational errors or obsolete information. This flawless assessment underscores the meticulous attention to detail and rigorous quality control measures applied during the development and validation process of the SIM. According to the validators, that the overall impact of the digitalized strategic intervention material (SIM) in science 8 connotes engagement and stimulus towards the students that enhance cognitive empowerment and promotes higher order thinking skills among students.

Moreover, the total score of 16 points which connotes of verbal description of very satisfactory and verbal interpretation of passed. Validators have confirmed that the material is free from any technical or substantive flaws that could potentially impact the learning experience or undermine the educational objectives. All indicators affirms the SIM's excellence in content accuracy, language proficiency, and technical precision. This denotes that the digitalized SIM can be recommended for possible use in public schools provided that the revisions will be polished. This validation underscores the SIM's reliability as a robust educational resource that effectively supports learning objectives

Problem 4. Based on the findings of the study, what enhancement of the digitalized strategic intervention material (SIM) can be recommended?

Based on the findings of the study, several enhancements to the digitalized Strategic Intervention Material (SIM) in Science 8 can be recommended to optimize its effectiveness and address identified areas for improvement. Firstly, addressing concerns regarding audio-visual synchronization is paramount. Aligning audio cues with corresponding visuals throughout the SIM will ensure a seamless learning experience, minimizing distractions and enhancing comprehension. Additionally, revising or removing distracting graphics and unnecessary visual elements can improve focus and clarity, facilitating better understanding of key concepts. Furthermore, enhancing feedback mechanisms by providing more detailed and constructive feedback on student responses can guide their learning process and promote deeper understanding. Incorporating interactive elements, such as immediate feedback quizzes, can further enhance engagement and participation. Moreover, considering voice localization throughout the SIM can improve accessibility and engagement for students with diverse linguistic backgrounds. Ensuring the accuracy and functionality of hyperlinks within the SIM is also crucial, as it enhances the reliability and utility of the material. Consistency in language use should be maintained through a comprehensive review to ensure uniformity in terminology, grammar, and style, facilitating smoother comprehension. Lastly, leveraging multimedia integration, such as animations and interactive activities, can enrich the learning experience and deepen understanding of scientific concepts. By implementing these enhancements, the digitalized SIM can be optimized to maximize educational impact, foster student engagement, and facilitate mastery of scientific concepts among Grade 8 students.

Moreover, all corrections, suggestions, and comments provided by validators have been meticulously addressed and incorporated into the enhanced version of the digitalized Strategic Intervention Material (SIM) in Science 8. The enhanced SIM now features seamless audio-visual synchronization, revised and optimized graphics, improved feedback mechanisms, consistent language usage, accurate hyperlinks, and enhanced multimedia integration. These enhancements ensure a more engaging, effective, and accessible learning experience, supporting student mastery of scientific concepts and fostering deeper understanding among Grade 8 students.

This link presents the enhanced digitalized strategic intervention material in Science 8.

<https://drive.google.com/drive/folders/1ZF5FgKLHN49tRr5EyVi85mDWH4uxaKQx?usp=sharing>

4. CONCLUSION AND RECOMMENDATIONS

4.1 Conclusion

Based on the findings presented, the following conclusions were drawn.

The third quarter examination in Science 8 for the school year 2023-2024 revealed that students struggled to explain the properties of solids, liquids, and gases based on the particle nature of matter, with a low mean percentage score, indicating a lack of mastery this will be the basis in the development of digitalized strategic intervention material in Science 8.

To reinforce the least learned competency in Science 8, a strategic intervention material was developed digitally using the Microsoft Power Point Presentation and Classpoint.

Based on the validation of the experts, the digitalized strategic intervention material garnered a very satisfactory rating and passed the validation process, but further enhancement needs to replenish in instructional and technical quality. Thus, the digitalized SIM is recommended to be submitted in the division LRMDs section for further quality assurance.

In general, the developed digitalized strategic intervention material was enhanced according to the comments and suggestions by the validators.

4.2 Recommendations

Considering the findings and conclusions shown above the following recommendations are highly suggested.

Department of Education. They should facilitate the dissemination and implementation of the digitalized strategic intervention material (SIM) in Science 8 across all public schools and provide support and resources for further enhancement of the SIM in terms of instructional and technical quality.

School Principal. They should ensure that Science teachers are trained in effectively in developing a SIM to reinforce the least learned competency among students. They must allocate sufficient time and resources for teachers to integrate the SIM into their curriculum and instructional practices.

Science Teachers. They must be motivated to develop more strategic intervention materials to help the learners master their least learned skills.

Students. They should be actively engaging with the digitalized SIM to enhance their understanding and mastery of Science concepts related to the particle nature of matter.

Parents. They should encourage and support their children to participate actively in their class to improve Science performance.

Future Researchers. They can test the effectiveness of the digitalized strategic intervention material in Science 8.

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