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STRATEGIC INTERVENTION MATERIAL (SIM) IN FUNDAMENTALS OF POLYNOMIALS FOR GRADE 8.

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Master of Arts

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CHAPTER I

The Problem and Related Literature and Studies

Introduction

Teaching effectiveness is influenced by a teacher's innovations and creativity in addition to their knowledge and abilities. Teachers must continuously create new intervention materials and strategies to meet the evolving needs of their students and ultimately raise the standard of the teaching-learning process. For the majority of students, comprehending the essential role that instructional materials play in their learning is equivalent to receiving a well-delivered lesson. Innovative educators support each student's unique and varied learning needs and preferences by exposing them to a range of teaching strategies. Teachers can leverage students' strengths and strengthen their ability to advocate for themselves by using these strategic intervention materials. The goal of education is to cultivate critical and analytical thinking abilities.

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One of the Department of Education's objectives is to ensure that no student is left behind. This ensures that each student has an equal chance to strengthen their areas of weakness and improve their academic performance. Consequently, the strategic intervention materials address the learners' exceptionally poor performance in acquiring their least mastered competencies. The primary goal of education is to ensure that students are acquiring the knowledge and skills deemed necessary for them to master their least-mastered competencies. Learning is more frequently used at the primary level, even though more high schools are adopting the strategy.

The Strategic Intervention Materials help the students develop the skills they were unable to acquire during the regular sessions. A PowerPoint presentation, printed materials, or computer exercises can all be used to deliver it. The Strategic Intervention Materials focus on a single specific competency intended for remediation.

Going back to the beginning, learning gaps among students could be one reason why Filipinos did worse in mathematics than people in other countries. In order to

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assist students in coping with this, the Department of Education (DepEd) has suggested implementing interventions. Some recommended interventions include summer classes or summer camps, teacher modeling followed by guided and independent practice, cross-age tutorials (where students in higher grades mentor those in lower grades), and the use of Strategic Intervention Materials (SIMs), which are worksheets made by teachers to target the least mastered competencies.

Many students' misconceptions keep them from advancing in their studies of mathematics (de Gracia, 2016). Interventions can help students acquire and master the learning competencies in targeted and structured ways. It has been shown that using Strategic Intervention Materials (SIM) is one of the best ways to help students develop their learning competencies. Using Strategic Intervention Materials, the least-learned competencies are mastered. These resources allow students to conduct independent research and learn through exercises and simple interactive dialogs. The researcher was motivated to conduct this study in order to determine how well the strategic

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intervention material improved students' mathematical performance, especially with regard to basic operations in Mathematics 8. In order to provide effective, timely, efficient, and high-quality education, it is imperative that instructional materials for teaching and learning mathematics be developed and evaluated. It is believed that this study can help students perform better academically even when they are learning remotely and can enable teachers to better support and mentor their students. The study's findings, if needed, serve as the basis or point of reference for the school to further develop and improve the way instruction is delivered, especially when it comes to utilizing intervention materials to improve student performance and mastery of the subjects covered.

The researcher decided to conduct the study to evaluate the Strategic Intervention Materials (SIM) in fundamentals of polynomials in Grade 8 Mathematics. The researcher sought to validate the strategic intervention materials so that they can be used formally in the school and can be shared with other schools in the district. Since the researcher is a Mathematics teacher, the researcher was

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exposed to the different teaching and learning problems encountered, especially by both teachers and students.

Review of Related Literature and Studies

The Use of DepEd Strategic Intervention Material (SIM)

The Department of Education launched a universal kindergarten program in 2011 and improved the curriculum for Grades 1 through 7 in 2012 as part of the K–12 Basic Education Program (BEP). This curriculum's main objective is to give Filipinos comprehensive 21st century skills. The Department of Education (DepEd) suggested a number of pedagogical strategies to accomplish this goal. However, using the most comprehensive pedagogical approaches—like inquiry-based learning—may occasionally fail to encourage students to learn. Furthermore, not every student would demonstrate mastery of every learning competency. As a result, for a variety of reasons, students are least proficient in certain learning competencies. In order to address these issues, DepEd recommended using Strategic Intervention Material (SIM), which is a teacher-prepared worksheet that focuses on the least-mastered competencies

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(DepEd order no. 39, s.2012), as an intervention form that can close learning gaps.

The researcher wants to address the least mastered skill in addition of integers in this paper. According to experts, number sense is essential for the development of higher mathematical skills, so it is crucial to assist students in improving their addition abilities. According to Devlin (2017), number sense is the most crucial mathematical concept in K–12 education in the twenty-first century. It refers to the comprehension of various relationships between numbers and operations and the adaptable application of these relationships (Akkaya, 2015). Additionally, it is stressed that students must have access to a well-thought-out, targeted intervention that gives them the chance to investigate and discuss important ideas, draw connections between ideas, and advance their comprehension at a suitable speed and in accordance with a suitable conceptual and developmental sequence. Using these, the researcher created an intervention to support, strengthen, and enhance students' addition abilities. In order to give students a more engaging way to explore the

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concepts, the researcher created Strategic Intervention Material, which provides a conceptual and developmental sequence for adding integers.

Numerous studies on the application of SIM were also carried out in mathematics. Dumigsi and Cabrella (2019) used a quasi-experimental design with pre-test and post-test data collection to examine the efficacy of SIM in Grade 9 Mathematics as remediation in least mastered competency, solving problems involving quadratic functions. The experimental group that used the SIM as a remediation tool outperformed the control group that used learner's material. Similar to this, Diaz and Dio (2017) used a quasi-experimental research design to examine the impact of Tri-in-1 SIM on teaching right triangles to 60 students in Grade 9 Mathematics. The results showed that students' performance was superior to that of a non-SIM instruction.

Strategic Intervention Materials (SIM) as a Remedial Tool

In order to close learning gaps, particularly in mathematics, Strategic Intervention Materials (SIM) have become a useful supplemental tool. Dumigsi and Cabrella

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(2019) claimed that SIMs are appropriate for students who struggle with mathematics because they offer interactive, learner-centered scaffolded instruction. These resources, which are designed to be straightforward, interesting, and closely related to the curriculum, are frequently used to reinforce "least-learned competencies," as defined by the Department of Education.

Additionally, Flores et al. (2024) discovered that SIMs created for algebraic subjects significantly raised students' academic achievement. They emphasized, in particular, that materials based on relevant and contextual content were more likely to foster comprehension and retention. In a similar vein, a study by Abejero (2024) showed that improved activities, such as SIMs, led to statistically significant increases in the polynomial operations scores of Grade 8 students.

SIM in Algebra and Polynomial Operations

Students frequently struggle with the abstract nature of polynomials, according to research on algebraic interventions. Students' performance and engagement

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significantly improved after Langtiwan (2022) created a SIM especially for factoring polynomials in Mathematics 8. The results showed that polynomial operations benefited from targeted intervention even though addition and subtraction were not specifically targeted.

Similarly, Abejero (2024) found that after using teacher-developed materials that included polynomial operation exercises, students' proficiency levels significantly changed after the intervention, going from mostly beginning or developing to proficient and highly proficient levels.

The Concrete–Representational–Abstract (CRA) Approach in SIM

The Concrete-Representational-Abstract (CRA) instructional sequence is used by many successful SIMs. This approach entails moving from tangible manipulatives (concrete) to visual models (representational), and then to abstract symbols and equations. According to Doabler et al. (2015), structured curriculum designs that adhere to the

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CRA model facilitate students' deeper internalization of algebraic concepts.

In a related study, researchers from Brunei (2019) employed SIMs with integer operations and discovered statistically significant gains in students' post-test scores; the CRA sequence was crucial to their intervention design. Their results validate the use of the same teaching method for polynomial addition and subtraction.

Motivation and Engagement through SIM

A key component of learning mathematics is motivation, particularly when students come across abstract concepts like polynomials. Quintanilla (2019) observed higher student motivation and engagement when teaching polynomial addition and subtraction through experiential activities, such as manipulatives made of candy. These interactive, enjoyable interventions fit with SIMs' design ethos.

Additionally, the ALEX ALEX "Thinking Tree" strategy (2020), which included polynomial exit ticket, showed that brief, targeted interventions improved accuracy and student

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reflection while boosting engagement without overwhelming students.

Teacher-Made SIM and Classroom Implementation

The contextualization of SIMs and how well they fit the learners' environment and level are often key factors in their success. In 2023, a teacher-made SIM study found that when local examples and visual aids were included, contextual, carefully sequenced activities improved the performance of struggling Grade 8 students on polynomial tests.

In order to guarantee practicality and alignment with instructional goals, Rodrigo (2015) also emphasized the significance of integrating teachers in the validation process and matching SIM with national curriculum standards.

Learning Mathematics

According to King (2017), exponents are a basic mathematical tool that should be learned. However, many people still have difficulty with them, which is completely understandable given how difficult exponents can be, not to

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mention related operations like fractions and radicals. Learning the discipline of mathematics can be difficult for different types of learners. Students frequently refer to mathematics as the "gatekeeper" of success. This makes it more difficult for them to complete high school and eventually be successful in their careers. A person's ability to make crucial decisions about their education, life, and career is impacted by a lack of adequate mathematical knowledge and skills.

Students fall or fail in mathematics for a variety of reasons. Many people were less successful in learning mathematics because they said they "never understood math" or "never liked it because it was too abstract and did not relate to them" when asked. In her talk on the etiology of mathematics learning, Tañedo (n. d.) noted that effective mathematics instruction should include opportunities for concept building, pertinent, difficult questions, problem solving, reasoning, and connections between the curriculum and real-world scenarios. Students who use rote memorization will have trouble identifying and remembering mathematical concepts and generalizations.

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The contents of the K–12 Framework are organized in a spiral pattern. Because students learn at different speeds, doing this gives them the chance to deal with the material in a developmental way over time. Throughout the curriculum, concepts can be expanded upon and connected to prior knowledge from prior years. As they advance, students gain more knowledge and expertise in the study of mathematics and its ideas.

Effectiveness of Strategic Intervention Materials

The efficacy of strategic intervention materials in helping students master the competencies established by the Department of Education has been the subject of numerous studies. In her study Beating the Numbers through Strategic Intervention Materials (SIMs): Innovative Science Teaching for Large Classes, Alboruto (2017) discovered that the application of SIMs greatly enhanced both the development of science process skills and the mastery of science concepts. Students were divided into two groups—the experimental group and the control group—as part of her experimental research design. The experimental group received the Strategic Intervention Materials as a learning

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aid, which was similar to the approach employed in this study. Additionally, she came to the conclusion that the project strategic intervention material was successful in raising student achievement. Villonez (2018) also came to the conclusion that using SIM was superior to using traditional methods when teaching certain science topics.

In their study, "Effectiveness of Strategic Intervention Material in Mathematics as Remediation for Grade 9 Students in Solving Problems Involving Quadratic Functions," Dumigsi and Cabrella (2019) discovered that the Strategic Intervention Material was a useful remediation tool for Grade 9 students in solving problems involving quadratic functions. The two groups completed a pre-test and a post-test as part of a quasi-experimental design.

Additionally, potential users may find SIM to be highly acceptable, applicable, and helpful. Herrera and Soriano (2016) found that when fourth-year students used SIM in Mathematics IV, they quickly grasped the subjects they had learned the least. Additionally, SIM is a competency-based academic support approach that will assist students in upper elementary, middle high school, and

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higher education in becoming successful and independent learners, according to Blalock (2010).

Math and Numeracy Skills

For students to succeed in high school mathematics classes, where advanced lessons require mastery of lower mathematics, numeracy skills are essential. Number sense is an attempt to highlight the idea that teachers can support the learning process in convergence even with highly diverse learners. Every educator is aware of the value of numeracy across the curriculum. The ability to handle numbers and carry out basic calculations is only one aspect of numeracy. It consists of the knowledge, skills, attitudes, and behaviors that students will need to apply mathematics in a range of situations. Instead of using the term "numeracy," the PISA study defines "mathematical literacy" as: The ability to recognize, comprehend, and apply mathematics as well as to make well-founded decisions about the role that mathematics plays, as needed for the individual's current and future private life, occupational life, social life with peers and relatives, and life as a constructive, concerned, and reflective citizen. According

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to Insorio's (2020) study, students with low numeracy skills may find it difficult to comprehend higher mathematics, which could lead to frustration. Over time, students may grow to fear handling mathematical ideas or studying mathematics in class. The children seemed disinterested in the material, despite their teachers' encouragement and strategies.

Early math and numeracy, according to Tiedeman (2019), is the general comprehension of numbers and fundamental mathematical ideas (Harris & Petersen, 2019). These include the ability to describe shapes and positions, count, compare and contrast, and solve problems (Aunio, Heiskari, Van Luit & Vuorio, 2015; Harris & Petersen, 2019; Ramani & Eason, 2015). All subsequent math classes are built on the foundation of early math and numeracy skills. Students will continue to struggle with more complex math concepts if they lack these abilities. One of the fundamental early math skills that students must acquire for all academic and extracurricular activities is problem-solving. Early math is the ideal way to teach language and critical thinking skills to students.

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Moreover, the possible indirect effects of literacy and numeracy skills on science achievement are unknown. Research suggests that prior cognitive skills may be connected to the basis of interest (a desire to take on a challenging task and being motivated by interest and curiosity) and/or self-concept (beliefs about personal competency in learning) (Walgermo, Foldnes, Uppstad, & Solheim, 2018). According to a Victoria State Government article (n.d.), students require the knowledge, skills, attitudes, and behaviors known as numeracy in order to use mathematics in a variety of contexts. It involves recognizing and understanding the role of mathematics in the world as well as possessing the mindset and abilities to use mathematical knowledge and skills on purpose. In their personal, academic, and professional pursuits, most people regularly come across mathematics in their daily lives. Equally important are the vital roles that algebra, functions and relations, logic, mathematical structure, and mathematical thinking play in assisting people in comprehending the human and natural worlds and how they interact with one another.

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Mathematics Literacy

Children start to develop a sense of numbers even before they start school, according to Yilmaz (2017). To comprehend the traditional mathematics taught in schools, one must first develop number sense. This number sense consists of three primary parts: counting, arithmetic operations, and number knowledge. The goal of this study was to examine the intricacy of young children's number sense development in relation to two primary domains: counting and number knowledge, between the ages of four and seven. The development of number sense was examined using semi-structured tasks and clinical interviews. Five different evaluation tasks were assigned to three children. The answers were examined to ascertain the students' developmental difficulties and degree of number sense comprehension. The findings were separated into two categories: counting and children's understanding of number concepts and their ability to finish number word sequences.

According to Schindler (2019), a crucial skill for children's mathematical development is quantity recognition in whole number representations. There is a correlation

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between arithmetic achievement and the ability to recognize quantities in structured whole number representations, but little research has been done on this subject. In this study, the researcher investigated the differences in amount recognition in structured whole number representations between students who are normally developing (TD) and children with mathematical difficulties (MD). Quantity recognition in whole number representations, or the ability to comprehend sets of elements in whole number representations and state how many there are, is a crucial mathematical skill needed to develop a number sense (Scherer et al., 2016).

Layug et al. (2021) claimed that mathematics literacy is a wide range of knowledge, comprehension, and appreciation of what mathematics can accomplish rather than presuming mastery of numerous mathematical disciplines or complex mathematical formulas. The Journal of Physics: Conference of Series defines mathematics literacy as "the ability to understand and apply basic knowledge of mathematics in everyday life," which entails comprehending and combining mathematical fundamental concepts,

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terminologies, facts, and abilities in response to the demands of the real world. The importance of number-ordering skills for children's and adults' numeracy skills has been demonstrated by recent studies. In the current study, we demonstrated a strong correlation between adults' arithmetic performance and both number comparison and ordering skills, with the ordering skills impact size being larger. Additionally, when it came to comparison and sorting tasks involving months, participants displayed similar (canonical or reverse) distance effects as they did when the activities involved numbers. Additionally, there was a strong correlation between performance on these tasks and math skills. This demonstrates that the mechanisms underlying the connection between mathematical proficiency and comparison and ordering skills are not limited to the study of numbers (Morsanyi, 2016).

Diagnostic Tool for Effective Teaching

The pretest and posttest can be a useful diagnostic tool for more effective teaching, according to Kuehn (2017). It ought to be made to gauge how much knowledge a pupil has gained in a particular subject. In order to

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accomplish this, the test must include questions pertaining to every subject discussed during the quarter. The posttest score should be higher than the pretest score in order to show that the student has improved during the specified quarter. According to Goldman (2014), the pretest and posttest measure the amount of knowledge that a group of students with various learning styles and educational backgrounds have learned in class.

According to Mouly (2015), a pre-test is a test that is administered to gauge a variable's outcome prior to the execution of an experimental manipulation. Following the implementation of the experimental manipulation, a post-test is administered that is identical to the pre-test. By comparing the pretest and posttest results, the experimenter was able to determine whether the experimental manipulation had any effect. Any discrepancies are probably the result of the researcher's manipulation, either through action or an experimental approach to the study.

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21st Century Teachers and Strategic Intervention Material (SIM).

A person can develop life and practical skills through mathematics, a highly sophisticated yet useful discipline. Different instructional materials (IMs), which are essential for the teaching-learning process because they cater to the various needs of learners, make learning its concepts easier. According to Diaz and Dio (2017), Strategic Intervention Material (SIM) is an easy-to-use instant message that can be responded to by a single student or by a group of students both inside and outside of the classroom. Teachers in the twenty-first century use Strategic Intervention Material (SIM) in addition to technology. SIM is a teaching aid that is incorporated into instructional strategies to increase student engagement and comprehension. Additionally, it is used to teach least mastered competencies appropriate for students in the twenty-first century or for remediation (Sun.Star Pampanga, 2017).

Strategic Intervention Material, or SIM for short, is a teaching tool used in the Philippines to reinforce

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concepts or subjects that students are thought to have mastered the least. The Guide Card, Activity Card, Assessment Card, Enrichment Card, and Reference Card are its fundamental components (Plenos & Josephine, 2014). It is one of the strategies used by the Department of Education to improve students' academic performance in the area of mathematics. Math secondary teachers received training in the creation of SIMs through DepEd Memo No. 117, series of 2005 titled "Training Workshop on Strategic Intervention Materials (SIMs) for Successful Learning." as part of stepping up and creating strategic intervention materials as a means of correcting subpar math performance. The SIM-making competition was added by the Department of Education to math competitions at the school, division, regional, and national levels. According to DepEd Order No. 39, s. 2012, learning gaps must be addressed through interventions. One of the recommended forms of intervention that can close learning gaps is the use of Strategic Intervention Material (SIM). Students can improve their academic performance by using SIM as a remediation tool at their comprehension level.

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SIM and Learners' Academic Achievement

The beneficial effects of SIM on student performance have been repeatedly confirmed by empirical research. Using a quasi-experimental design, Opulencia (2019) discovered that SIM-based instruction significantly improved the post-test scores of Grade 6 students who were having difficulty with fraction subtraction when compared to a control group. Hernandez et al. (2019) also noted significant improvements in Grade 5 students' multiplication fact fluency following SIM interventions. Additionally, Ramos (2019) found that SIM improved HUMSS students' academic performance in mathematics, with experimental groups outperforming control groups in post-test mean scores.

SIM in Remediating "Least-Mastered Competencies"

Research demonstrates how well SIM addresses concept-specific flaws. Flores et al. (2024) assessed Grade 7 students' challenges with integer operations and created SIM that focused on subtraction; the intervention was found to be very appealing and beneficial. In order to create K-12 aligned SIMs that emphasize the targeted nature of these

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materials, Laña (2023) carried out a descriptive study to identify eight least-learned competencies in Grade 8 math.

Structured Intervention and Design-Based Approaches

Systematic, design-based frameworks are used in effective SIM development. In order to help Grade 7 students solve linear equation systems, Diomampo (2019) used a quasi-experimental SIM, which resulted in a significant learning gain from mean 18.19 to 36.60 ($t = 24.62$). Zabala and Carpio (2023) used SIM in Grade 11 stock and bond content in more general educational contexts, and the experimental group's post-test mean scores were significantly higher. The significance of structured intervention design and relevance is emphasized by these studies.

SIM, Numeracy, and Conceptual Fluency

Additionally, SIM has been successful in bolstering fundamental numeracy abilities. In order to improve mathematical fluency among Grade 9 students, Laysico (2019) administered a SIM intervention on integer operations; the results demonstrated notable improvements between pre- and post-test scores. Furthermore, Limbago-Bastida and Bastida (2022) discovered that students in Grade 11 physical

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science who received instruction via SIM outperformed those who received traditional instruction in terms of learning outcomes.

Contextual Relevance and Student Engagement

Student engagement is also impacted by SIM's design and contextual relevance. Adonis (2020) created contextualized SIM for Grade 9 geometry by incorporating linguistic and cultural elements; this led to high teacher ratings and notable gains in conceptual understanding. These results suggest that integrating SIM into the cultural context of students enhances their motivation and comprehension.

Synthesis of Related Literature and Studies

Strategic Intervention Materials (SIMs) are useful teaching and remedial tools created by the Department of Education to address students' least-mastered competencies and close learning gaps, according to the reviewed literature and studies. SIMs offer structured, competency-based, learner-centered activities that reinforce challenging mathematical concepts through contextualized and captivating learning experiences in accordance with the

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K-12 curriculum. The creation and application of SIMs as one of the main intervention techniques for raising students' academic performance is further supported by DepEd policies.

The literature also emphasizes how difficult it is for students to learn mathematics, especially algebra and polynomial operations, because of the abstract nature of the concepts and their lack of basic mathematical literacy and numeracy abilities. For students to succeed in higher-level mathematics, researchers concur that mastery of prerequisite mathematical concepts, conceptual understanding, and meaningful learning experiences are crucial. Therefore, to enhance students' mathematical performance, instructional strategies that support conceptual growth, active engagement, and scaffolded learning are required.

SIMs greatly enhance students' academic performance in a variety of mathematics competencies, including integer operations, quadratic functions, linear equations, factoring, and polynomial operations, according to numerous empirical studies. Learners exposed to SIM-based

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instruction consistently scored higher on post-tests than those taught using traditional methods, according to these studies. Additionally, it was discovered that SIMs created with learner-friendly instructional designs, contextualized activities, and the Concrete–Representational–Abstract (CRA) approach improved students' motivation, engagement, conceptual understanding, and retention of mathematical concepts.

The significance of locally contextualized and teacher-developed SIMs is also emphasized by the reviewed studies. Effective SIMs should be validated by professionals and classroom teachers, in line with curriculum standards, and customized to the needs of students and learning environments, according to researchers. Similarly, identifying least-mastered competencies and assessing the efficacy of intervention materials depend heavily on the use of diagnostic tests like pretests and posttests.

Few studies have specifically addressed the Fundamentals of Polynomials among Grade 8 learners, especially when it comes to addressing the least-mastered

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‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

competencies through a methodically developed and validated Strategic Intervention Material, despite the large number of studies showing the efficacy of SIMs in mathematics. The majority of previous research focused on other mathematical subjects like factoring, quadratic functions, integers, and linear equations. Furthermore, only a small amount of research has looked at the acceptability of SIMs by evaluating both expert validators and math teachers.

By creating and evaluating a Strategic Intervention Material in Fundamentals of Polynomials for Grade 8 learners based on identified least-mastered competencies, the current study fills this gap. This study aimed to provide an effective instructional resource that may improve learners' conceptual understanding and academic performance while adding to the expanding body of research on mathematics intervention materials. It is based on DepEd intervention policies and is supported by modern instructional principles like contextualized learning and the Concrete–Representational–Abstract approach.

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Conceptual Framework

Instructional material is a teaching resource that supports instruction or learning in the form of print, electronic, and online/internet-based materials. Instructional theories play an important role in developing and designing instructional-aid or materials. These theories help in shaping and defining the outcome of the instructional material.

In developing instructional material and assessment of learning tool in Mathematics 8, this study is anchored in the ADDIE (Analysis, Design, Development, Implementation, Evaluation) model. The model uses the step-by-step planning of developing instructional material that consisted five phases: analysis, design, development, implement and evaluation. The ADDIE model is one of the most often used models for creating on instructional material. This model is an approach that assists instructional designers, content developers, and even teachers in creating an efficient, effective teaching design to any instructional material. The ADDIE model can be used in any setting, whether online or face-to-face.

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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

Instructional design has played an integral role in the education and corporate sectors since its inception. Technology has greatly influenced various instructional design factors, including learners' and instructors' beliefs about knowledge, instruction, and learning. According to one industry trends report on instructional design, for instance, emerging technologies and concepts, such as gamification, virtual reality, and artificial intelligence continue to have an impact on the learning process.

The study began by identifying and diagnosing the least-learned competencies in polynomial operations among Grade 8 learners through summative assessment and quarterly exam, a method similar to those used in SIM research on other mathematical topics. With diagnostic data in hand, the research moved to the design and development stage intervention materials. These materials were then validated by mathematics teachers and experts, ensuring alignment with the Grade 8 K–12 standard.

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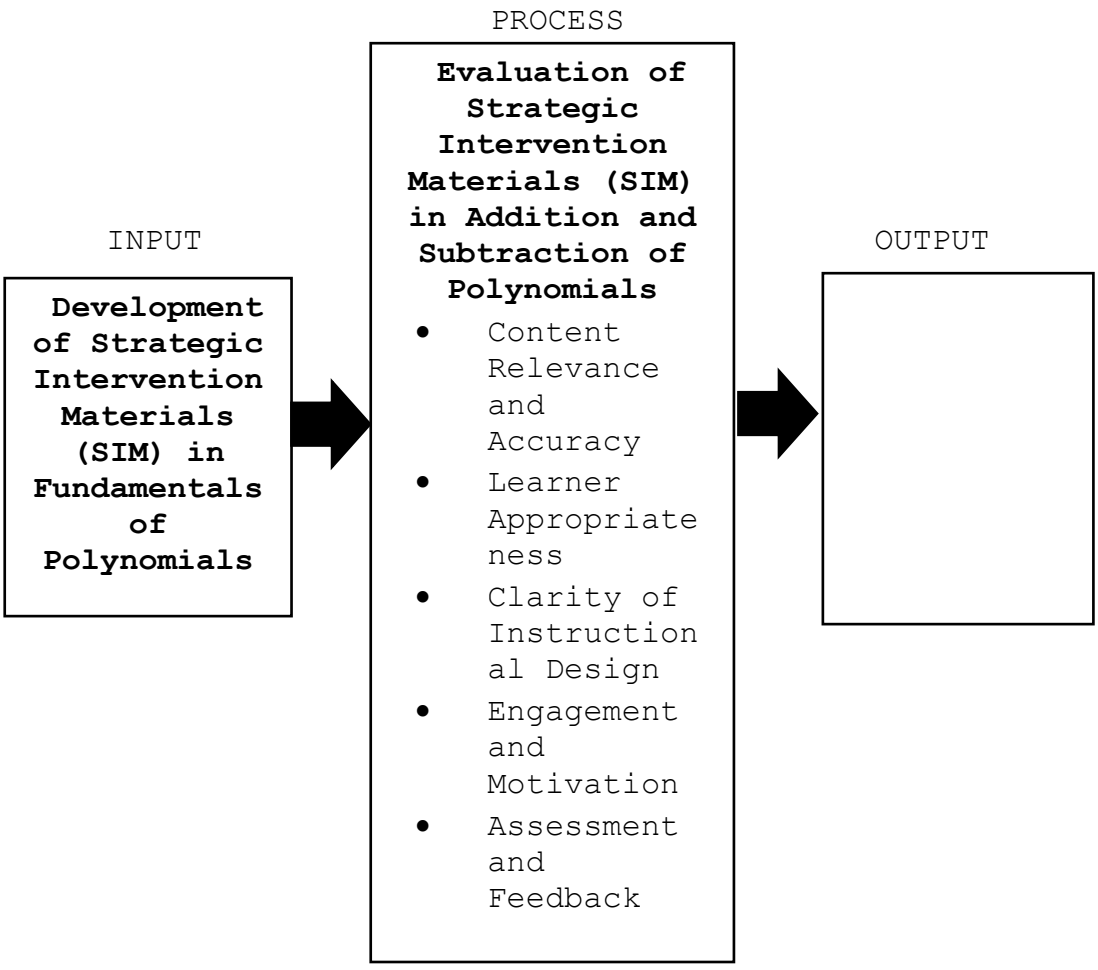

Figure 1.

Research Paradigm

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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

Definition of Terms

Assessment and Feedback. It refers to the inclusion of evaluative activities in the SIM that allow learners to check their understanding of polynomial concepts. It is measured by the presence of practice exercises, formative tests, immediate answer keys, and feedback mechanisms that guide students in recognizing errors and improving performance.

Content Relevance and Accuracy. It refers to the extent to which the SIM provides correct, updated, and curriculum-aligned concepts and examples on the fundamentals of polynomials. It is measured by how well the material reflects the Grade 8 Mathematics learning competencies and avoids misconceptions or errors.

Clarity of Instructional Design. It refers to how clearly the SIM presents directions, explanations, and problem-solving steps. It is measured by the organization of content, logical sequencing of lessons, readability, and user-friendly layout that facilitates self-directed learning.

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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

Engagement and Motivation. It refers to the ability of the SIM to capture and sustain students' interest in learning polynomials. It is measured by the presence of interactive activities, real-life applications, visuals, and motivating prompts that encourage active participation and persistence in learning tasks.

Fundamentals of Polynomials. It refers to the basic concepts, rules, and operations involving polynomials as presented in the SIM. It includes identifying terms, coefficients, degrees, types of polynomials, and performing operations such as addition, subtraction, multiplication, and division. In this study, the "fundamentals" are operationalized as the core Grade 8 Mathematics competencies that the SIM aims to strengthen.

Instructional Innovation. It refers to the introduction of new teaching ideas, methods, or devices. It also indicates that one adopts new teaching concepts/methods/or tools.

Learner Appropriateness. It refers to the suitability of the SIM to the learners' cognitive level, prior

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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

knowledge, and abilities. It is measured by the extent to which the language, activities, and examples are understandable and relatable for Grade 8 students.

Instructional Quality. It refers to how the strategic intervention materials are presented based on the outcome-based definitions of student behaviors and accomplishments—such as achievement of learning outcomes.

Polynomials. It refers to algebraic expressions consisting of variables, coefficients, and exponents combined using the operations of addition, subtraction, and multiplication. In this study, polynomials are operationalized as the main mathematical content covered in the SIM, serving as the subject matter through which learners' understanding and skills are enhanced.

Strategic Intervention Materials (SIM). It refers supplementary learning resources designed to help students who are struggling with specific concepts or skills in their regular coursework. They are used as a form of remediation, providing targeted instruction and activities to help students master material they haven't grasped during regular lessons.

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‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

Statement of the Problem

The study focused on the development and evaluation of Strategic Intervention Materials (SIM) in fundamentals of polynomials in grade 8 among public secondary schools in the Talavera District of Schools Division of Nueva Ecija.

Specifically, this study sought to answer the following questions:

1. How may the development process of Strategic Intervention Material (SIM) in fundamentals of polynomials for grade 8 be described in terms of:
    1.1 Planning Phase
    1.2 Development Phase
    1.3 Evaluation Phase
    1.4 Revision Phase?
2. How may the mathematics teachers and experts evaluate the developed Strategic Intervention Materials (SIM) in fundamentals of polynomials in terms of:
    2.1 Content Relevance and Accuracy;
    2.2 Learner Appropriateness;

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‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

2.3 Clarity of Instructional Design;

2.4 Engagement and Motivation; and

2.5 Assessment and Feedback?

3. Is there a significant difference in the evaluation of Mathematics teachers and Experts in the developed Strategic Intervention Material (SIM) in fundamentals of polynomials?

4. How may the developed Strategic Intervention Material (SIM) in fundamentals of polynomials for grade 8 be improved based on the recommendations?

Hypothesis of the Study

1. There is no significant difference in the evaluation of Mathematics teachers and experts in the developed Strategic Intervention Material (SIM) in fundamentals of polynomials for grade 8.

Significance of the Study

The findings of the study are beneficial to the following persons or professionals and may eventually contribute to the development of the academe and the academic works.

This study is significant to the following:

International Research Journal of Education and Technology (IRJEdT)
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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

Students. The result of the study may give additional learning experiences to students. It can be a preliminary and fundamental asset of the students to further increase and develop their potentials in mathematics. Their inherent interest was utilized to make their learning of mathematics enjoyable.

Mathematics Teachers. They may get additional insights and approaches in teaching their lessons. The developed strategic intervention material (SIM) can be used as an additional teaching material. The result of this study may also serve as a challenge to them to develop other learning materials in other topics in mathematics.

Instructional Materials' Developers. The developed strategic intervention material (SIM) may be considered by writers and developers of instructional materials as an additional inclusion in the textual presentation of mathematics topics. Such inclusion motivates students to read their books because of the strategic intervention materials (SIM) included therein.

School Administrator. The result of the study may provide insights as well as policy directions to school

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‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

administrators on how mathematics can be taught. They can be encouraged to challenge their teachers to produce or develop other learning materials.

Future Researcher. The result of this study can be made an off-shoot to other research studies of similar nature.

Scope and Limitation

The respondents of this study were the Junior and Senior High School Mathematics teachers among public secondary schools in the Talavera District, Province of Nueva Ecija. The researcher created strategic intervention materials in fundamentals of polynomials which were anchored in the Most Essential Learning Competencies (MELCs) of Mathematics 8 for the School Year 2025-2026. The group of mathematics experts was composed of Head Teachers and Master Teachers. They validated the responses of the mathematics teachers since the experts were members of validation and screening committee of learning resource management; they had the skills and knowledge in validating learning activity sheets and modules used by the schools in the Division of Nueva Ecija.

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CHAPTER II

Methods

Research Design

In order to secure adequate and reliable information for the evaluation of objectives of the study, the researcher used the descriptive research method. Descriptive research is the most widely-used research design. This was indicated by the numerous theses, dissertations, and non- academic researchers. its primary aim of is to describe existing beliefs, opinions or conditions of a social group and determine the relationships among variables covered.

The goal of descriptive research is drawing and classifying the phenomenon. Descriptive research is the research design in which data is collected in a qualitative manner and analyzed using quantitative procedures. Descriptive research refers to the scientific methodology in which observation of the sampled population is carried out in its natural surroundings. Descriptive research methodology intends to find out 'what' related to a

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‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

phenomenon. In this method, data are collected qualitatively and analyzed through a quantitative method. Data is collected through methods like survey, interview, correlation study, observation study, or content analysis.

Respondents of the Study

The respondents of the study were the Junior and Senior High School Mathematics teachers and Mathematics experts such as Master Teachers and Head Teachers in the Talavera District of the Schools Division of Nueva Ecija.

The respondents came from the different public secondary and integrated schools in the Talavera District of Schools Division of Nueva Ecija. They taught Mathematics in Junior and Senior High Schools.

Table 1 presents the breakdown of the respondents of the study.

Table 1

Table of Respondents

Schools	Respondents
Talavera National High School	20
San Ricardo National High School	13

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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

Sibul National High School	8
Bulac National High School	5
Tabacao National High School	5
Engr. Porfirio High School	2
Sicsican Matanda Integrated School	4
Bakal II Integrated School	3
San Pascual Integrated School	4
Talavera Senior High School	8
Total	**72**

Materials and Instruments

Description. The main source of data in this study was the questionnaire which describes the content relevance and accuracy, learner appropriateness, clarity of instruction and design, engagement and motivation, and assessment and feedback.

The items in the questionnaires came from the specific considerations in evaluating Mathematics Intervention Materials.

Response Mode. The items in the questionnaire for the teachers' evaluation and validation on Strategic

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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

Intervention Material (SIM) in fundamentals of polynomials for grade 8 were rated using this four-point scale:

Numerical Rating		Verbal Interpretation
4	-	Excellent
3	-	Good
2	-	Adequate
1	-	Weak

Reliability and Validity of the Instrument

The thesis advisory committee and research critics examined the instrument to determine its content validity. There were a number of talks and consultations to ensure the validity and reliability of every question on the surveys. Teachers in other major of specialization were also given the questionnaire in order to validate the main tool. There were two administrations of the questionnaire spaced two weeks apart. The reliability analysis employed Cronbach's alpha, which yielded a significant result of 0.913, indicating a 91.3% dependability rate for the instrument.

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‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

Data Gathering Procedure

The researcher asked permission from the Office of the Schools Division Superintendent to conduct the study. After obtaining permission, the researcher distributed copies of the questionnaire to the respondents. The researcher assured the confidentiality of their responses after the questionnaires were properly accomplished and collected.

Data Analysis

The data that were gathered in this study were analyzed using appropriate quantitative statistical tools in order to address the research problems concerning the development and evaluation of the Strategic Intervention Material (SIM) in Fundamentals of Polynomials for Grade 8. Descriptive and inferential statistical methods were employed to ensure a comprehensive analysis of the data obtained from Mathematics teachers and subject matter experts.

The development of the SIM was examined based on the systematic procedures followed by the researcher, which included the identification of least-learned competencies

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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

in fundamental operations of polynomials, formulation of learning objectives aligned with the Grade 8 Mathematics curriculum, development of instructional content and learning activities, preparation of assessment tasks, validation by experts, and revision of the material.

The evaluation of the developed SIM by Mathematics teachers and experts was analyzed using descriptive statistics. A researcher-made evaluation instrument employing a Likert scale was administered to the respondents. The data collected were analyzed through the computation of the weighted mean and standard deviation to determine the level of acceptability of the SIM in terms of content relevance and accuracy, learner appropriateness, clarity of instruction and design, engagement and motivation, and assessment and feedback. The computed mean scores were interpreted using corresponding verbal descriptions to determine the overall quality and effectiveness of the instructional material. The data gathered from the respondents were analyzed using the weighted mean.

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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

The following scale intervals with corresponding qualitative description were used as guide in interpreting the mean response.

Range	Interpretation
3.25-4.00	Excellent
2.50-3.24	Good
1.75-2.49	Adequate
1.00-1.74	Weak

To test the hypothesis number 1, "There is no significant difference in the evaluation of Mathematics teachers and experts in the developed Strategic Intervention Material (SIM) in fundamentals of polynomials for Grade 8", a t-test was used.

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CHAPTER III

Presentation, Analysis and Interpretation of Results

Development Process of Strategic Intervention Material (SIM) in Fundamentals of Polynomials for Grade 8

The Strategic Intervention Materials (SIMs) in Fundamentals of Polynomials were developed based on the least-mastered competencies of the Grade 8 learners, as reflected in the results of the first quarter examination administered to them in the 1st quarter S.Y 2025-2026. The development of the Strategic Intervention Material (SIM) in Fundamentals of Polynomials for Grade 8 followed a systematic and research-based procedure to ensure that the intervention material was responsive to the identified learning gaps of the learners. The process was anchored on the principles of instructional material development and the Department of Education (DepEd) guidelines on Strategic Intervention Materials. The procedure consisted of four major phases: Planning Phase, Development Phase, Evaluation Phase, and Revision Phase.

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‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

Planning Phase

The planning stage formed the basis of the research. The Most Essential Learning Competencies (MELCs), learner's modules, teacher's guides, the Grade 8 Mathematics Curriculum Guide, and other teaching resources pertaining to Fundamentals of Polynomials were all examined by the researcher during this phase. To provide a theoretical and practical foundation for the creation of the teaching materials, prior research on mathematics intervention programs and strategic intervention materials was also reviewed.

The development process's goals, parameters, and schedule were meticulously planned. The planning phase made sure that the intervention materials would specifically target the learning competencies that Grade 8 students found most challenging.

Needs Assessment

To identify the learning competencies that needed intervention, a needs assessment was carried out. 125 Grade 8 students, 57 of whom were male and 68 of whom were

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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

female, were given a researcher-made first quarter periodical test in Mathematics 8 that included 50 competency-based test items.

Just 70.40% of the students met or surpassed the Minimum Proficiency Level (MPL), according to the periodical test analysis. Additionally, female learners received a higher percentage (75.00%) than male learners (64.91%), suggesting that the remaining percentage of learners who did not meet the minimum proficiency level (MPL), especially in the least mastered competencies, required additional instructional support.

Table 2 shows the summary of Learners' First Quarter Periodical Test Results

Table 2

Summary of Learners' First Quarter Periodical Test Results

Description	Frequency/Percentage
Total Enrolled Learners	125
Male Learners	57
Female Learners	68
Total Test Takers	125
Learners who Achieved/Exceeded MPL	70.40%
Male Learners who Achieved/Exceeded MPL	64.91%
Female Learners who Achieved/Exceeded MPL	75.00%

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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

The Grade 8 assessment across sections Acacia, Mahogany, Narra, and Yakal yielded a 70.40% overall MPL pass rate with 100% participation (125 students). While the results demonstrated an overall satisfactory level of achievement, performance varied across demographic groups, with female learners achieving a 75.00% MPL compared to 64.91% for male learners. These test results became the primary basis for the researcher to develop a Strategic Intervention Material to increase the percentage of learners who achieved the minimum proficiency level especially in their least-mastered competencies.

This performance differential also indicates that instructional strategies and interventions should incorporate inclusive, targeted support to help bridge learning gaps for all students.

Identification of Competencies

The researcher ranked the competencies based on learner performance after examining the first quarter periodical test results. Since these represented the learning areas in need of immediate instructional intervention, the least-mastered competencies served as the

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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

foundation for the creation of the strategic intervention materials.

According to the results of the first quarter periodical test, learners had the most trouble with addition, subtraction, multiplication, division, and solving real-world problems involving polynomial operations.

By ranking the most and least learned competencies, the assessment also revealed the learners' strengths and weaknesses. The competencies to be included in the Strategic Intervention Material were chosen primarily based on the results.

Table 3 presents the most and least mastered competencies derived from the results of the first quarter examination administered to Grade 8 learners in their Mathematics subject.

Table 3

Most and Least Mastered Competencies of the Grade 8 Learners in Mathematics

Item No.	Most Mastered Competencies	Rank	Item No.	Least Mastered Competencies	Rank
6	Solve for the mode of ungrouped data.	1	22	Divide a multinomial by a	1

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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

4	Illustrate the measures of central tendency.	2	38	binomial using: A. Long Division Multiply binomials and multinomials using: A. special products B. Vertical Method	2
2	Arrange raw, unstructured data into an ordered sequence (ascending/descending) to prepare for statistical calculation.	3	25	Divide multinomial by a monomial.	3
7	Define an algebraic expression.	4	32	Solve real life problems involving the fundamental operations of polynomials.	4
9	Calculate the mean of ungrouped data.	5	15	Multiply and divide simple monomials	5
10	Determine the median of ungrouped data.	6	44	Addition and Subtraction of Multinomials.	6
12	Differentiate between mean, median, and mode using raw datasets.	7	26	Divide a multinomial by a binomial using Factoring.	7
17	Illustrate an algebraic expression.	8	48	Model real life situations using algebraic expressions.	8
20	Solve real life problems involving the measures of central tendency of ungrouped data.	9	37	Addition and Subtraction of Binomials.	9
30	Investigating the law of exponents.	10	29	Addition and Subtraction of monomials.	10

International Research Journal of Education and Technology (IRJEdT)
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	Peer-Reviewed	Open Access	International Journal	
	Volume: 09	Issue: 09	Sep- 2026	www.irjweb.com	

Table 3 shows the top 10 most and least mastered competencies of the Grade 8 learners in Mathematics. Least mastered competencies include the following: 1. Divide a multinomial by a binomial using Long Division; 2. Multiply binomials and multinomials using: A. special products B. Vertical Method; 3. Divide multinomial by a monomial; 4. Solve real life problems involving the fundamental operations of polynomials; 5. Multiply and divide simple monomials; 6. Addition and Subtraction of Multinomials; 7. Divide a multinomial by a binomial using Factoring ; 8. Model real life situations using algebraic expressions; 9. Addition and Subtraction of Binomials; and 10. Addition and Subtraction of monomials.

With these least-mastered competencies, twelve (12) SIMs were developed, highlighting the topics or concepts that need to be improved to enhance their knowledge, skills, attitudes, and values toward the subject. Developing instructional materials to address the learners' least-learned competencies was important because this ensured that all learners had equal opportunities to learn and develop these competencies.

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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

Selection of Content

The content of the Strategic Intervention Material was carefully chosen in accordance with the Most Essential Learning Competencies (MELCs) and the Grade 8 Mathematics Curriculum Guide, taking into account the identified least-mastered competencies.

To provide targeted remediation, each learning competency was broken down into distinct learning objectives and translated into a different intervention lesson. To promote progressive learning, the material was arranged from basic to sophisticated ideas. Examples, exercises, and enrichment activities were contextualized using familiar situations that learners could easily relate to.

The developed SIM primarily covered the following topics:

1. Addition and Subtraction of Monomials
2. Addition and Subtraction of Binomials
3. Addition of Multinomials
4. Subtraction of Multinomials
5. The Laws of Exponents

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‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

6. Multiplication of Monomials
7. Multiplication of Binomials and Multinomials using Special Products
8. Multiplication of Binomials and Multinomials using Box method
9. Division of Monomials
10. Division of Multinomials by a Monomial
11. Division of Polynomials by using Long Division
12. Division of Polynomials by using Factoring

The sequence of lessons was intended to strengthen prerequisite knowledge before introducing more advanced polynomial operations.

Development Phase

Designing of the Strategic Intervention Material (SIM)

Following the Department of Education's prescribed format, the researcher designed each Strategic Intervention Material to be learner-centered, engaging, and easy to understand.

Each SIM consisted of the following components:

Guide Card: It Introduces the lesson, objectives, motivation, and prerequisite concepts.

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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

Activity Card: It Provides guided learning activities and worked-out examples.

Enrichment Card. It Reinforces learning using higher-order thinking activities, games, puzzles, and contextualized problems.

Reflection Card: It Encourages learners to evaluate their own learning and identify areas for improvement.

Reference Card: It Lists the books, modules, and online resources used in developing the material.

Answer Card: It Provides complete solutions for self-checking and immediate feedback.

Also, according to Department of Education (DepEd) guidelines (rooted in foundational training programs like DepEd Memorandum No. 117, s. 2005), Strategic Intervention Materials (SIM) are evaluated and created based on four core criteria: sub-tasking, congruence, usability and functionality, and replicability, alongside standard structural components.

Sub-tasking. The main learning competency is broken down into smaller, logical, and manageable sub-tasks or

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activities that smoothly guide the learner from basic to complex concepts.

Congruence: There must be a strict alignment between the stated learning objectives, the focus skills, the activities, and the final assessment tools.

Usability & Functionality: The material must effectively function as an independent learning tool, requiring minimal teacher supervision while successfully engaging the student.

Replicability: The layout and design must use low-cost, accessible materials that are easy and affordable to reproduce or replicate for other learners.

To increase learner engagement, the SIM incorporated: colorful illustrations and graphics; step-by-step procedures in solving polynomial operations; contextualized Filipino-based examples; collaborative and independent learning activities; differentiated exercises; formative assessments; and mastery activities arranged according to increasing levels of difficulty.

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The instructional design emphasized learner participation, independent learning, and mastery of the identified competencies.

Table 4

Aligning the Parts of SIMs to the DepEd Prescribed Self-Learning Module in Developing Strategic Intervention Materials (SIMs)

Parts of SIM	Description	DepEd Prescribed Parts of the Module	Element
Guide Card	Provides an overview or introduction of the lesson, its objectives, and the pretest/pre-assessment.	What I Need to Know (Alamin) What I Know Subukin)	Introduction Learning Objectives Pretest
		What's In (Balikan)	Review
Activity Card	Provides a series of activities, exercises, or tasks for the learners to practice the target competencies.	What's New (Tuklasin) What is It (Suriin)	Activity 1 Discussion of Activity 1
Enrichment Card	Provides additional activities, exercises, or tasks for learners to develop mastery of the target competencies further.	What's More (Pagyamanin)	Enrichment Activities • Guided Activity 1 • Assessment 1 • Guided Activity 2 • Assessment 2 • Independent

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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

			Activity 1 dependent Activity 1 • Assessment 1 • Independent Activity 2 • Assessment 2
Reflection Card	Provides opportunities for the learners to reflect on their learning and apply it in real-life situations.	What I Have Learned Isaisip) What I Can Do Isagawa)	Generalization Application
Assessment Card	Measures learners' mastery of the target competencies through posttest/post assessment or evaluation activity.	Assessment (Tayahin) Additional Activities Karagdagang Gawain)	Assessment Additional Activities
Reference Card	Provides a list of references used in the materials and other references for future readings.	References Sanggunian)	References
Answer Card	Provides answers to activities,exercises, tasks,and assessments for self-check.	Answer Keys (Susi sa Pagwawasto)	Answer Keys

Table 4 shows the parts of Strategic Intervention Materials (SIMs) in Fundamentals of Polynomials. It typically contains parts such as the Guide Card, Activity Card, Enrichment Card, Reflection Card, Assessment Card, Reference Card, and Answer Card. In the developed SIMs for

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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

Fundamentals of Polynomials, the cards were embedded with the prescribed parts of the self-learning modules promulgated by the DepEd. The Guide Card encapsulates the parts "What I Need to Know," "What I Know," and "What's In." Meanwhile, the Activity Card presents the parts "What's New" and "What is It." On the other hand, the Enrichment Card articulates the parts "What's More (Guided Activity 1 and 2)," "What's More (Guided Assessment 1 and 2)," "What's More (Independent Activity 1 and 2)," and "What's More (Independent Assessment 1 and 2)." The Reflection Card shows the parts "What I Have Learned" and "What I Can Do." The Assessment Card presents the parts "Assessment" and "Additional Activities." The Reference Card reflects the part "References." Lastly, the Answer Card presents the part "Answer Keys." The Strategic Intervention Materials (SIMs) In Fundamentals of Polynomials are presented in a way that allows the teacher to interact with the students. It also uses illustrations and graphics (i.e., graphic organizers, infographics, diagrams, charts, etc.) for visual learners. Preliminary activities, along with formative assessment activities, are

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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

progressively presented to help learners establish mastery of the learning material, which is beneficial for their post-assessment activity at the end of each unit. There are also provisions for various activities contextualized in the local setting, as well as indigenous ideas. There are also game-based and collaborative activities to promote learners' interactions, especially the sharing of learning experiences. Additionally, there are opportunities provided for learners to contemplate, reflect, and apply their learning in daily life.

Preparation of Instructional Materials

After the instructional design was completed, the researcher prepared all instructional resources required for classroom implementation.

The preparation included: development of learner-friendly worksheets; contextualized examples and illustrations; activity sheets; assessment exercises; performance tasks; answer keys; visual organizers; enrichment activities; teacher implementation guide; and layout and graphic enhancement of the SIM.

International Research Journal of Education and Technology (IRJEdT)
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‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

The materials were formatted using readable fonts, attractive colors, and organized layouts to improve readability and learner motivation. Every activity was aligned with the intended learning competency and designed to promote active participation.

Evaluation Phase

Evaluation of the Strategic Intervention Material

The completed Strategic Intervention Material underwent content and technical evaluation to determine its quality, acceptability, and suitability for classroom use.

The developed SIM was evaluated by: 60 Mathematics teachers and 12 Mathematics education experts.

The evaluation utilized a researcher-made evaluation instrument based on the Department of Education standards for instructional materials. The validators assessed the SIM according to the following criteria: Content Relevance and Accuracy; Learner Appropriateness; Clarity of Instructional Design; Engagement and Motivation; and Assessment and Feedback.

The comments and recommendations provided by the validators were consolidated and incorporated into the

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revision of the SIM. Suggested improvements included providing additional examples and illustrations, using more localized contexts, clarifying instructions, increasing opportunities for guided practice, and ensuring alignment between learning activities and intended competencies.

Revision Phase

Revisions Based on Evaluators Comments

After the necessary revisions were made, the Strategic Intervention Material was finalized and prepared for implementation. The validation process ensured that the developed SIM was accurate, learner-centered, instructionally sound, and appropriate for improving the least-mastered competencies in Fundamentals of Polynomials among Grade 8 learners.

Table 5

Results of Evaluation

Evaluation of Developed Strategic Intervention Materials (SIM) in Fundamentals of Polynomials

ITEMS	Respondents			
	Teachers		Experts	
Content Relevance and Accuracy	WM	Verbal Description	WM	Verbal Description
The content is aligned with the learning	3.93	Excellent	3.91	Excellent

International Research Journal of Education and Technology (IRJEdT)
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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

competencies in the grade 8 mathematics curriculum such as MELCs or PPST-aligned indicators.				
The strategic intervention material targets the specific mathematics skills identified as areas of difficulty.	3.88	Excellent	3.73	Excellent
The strategic intervention material's concepts are accurate and mathematically sound.	3.90	Excellent	3.80	Excellent
Average	**3.91**	**Excellent**	**3.81**	**Excellent**

ITEMS	**Respondents**			
	Teachers		**Experts**	
Learner Appropriateness	**WM**	**Verbal Description**	**WM**	**Verbal Description**
The strategic intervention material is designed at the appropriate grade level and cognitive load.	3.93	Excellent	3.64	Excellent
The strategic intervention material caters to diverse learning styles such as visual, kinesthetic, and linguistic.	3.95	Excellent	3.82	Excellent
The strategic intervention material is culturally and contextually relevant to the learners.	3.92	Excellent	3.73	Excellent
Average	**3.93**	**Excellent**	**3.73**	**Excellent**

ITEMS	**Respondents**			
	Teachers		**Experts**	
Clarity of Instruction and Design	**WM**	**Verbal Description**	**WM**	**Verbal Description**
The strategic intervention material's instructions are clear	3.90	Excellent	3.73	Excellent

International Research Journal of Education and Technology (IRJEdT)
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‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

and easy to follow.				
The strategic intervention material's layout and sequencing are logical and user-friendly.	3.87	Excellent	3.64	Excellent
The strategic intervention material has guided examples, practice tasks, and feedback mechanisms.	3.95	Excellent	3.82	Excellent
Average	**3.91**	**Excellent**	**3.73**	**Excellent**

ITEMS	**Respondents**			
	Teachers		**Experts**	
Engagement and Motivation	**WM**	**Verbal Description**	**WM**	**Verbal Description**
The strategic intervention material includes interactive/hands-on activities.	3.92	Excellent	3.73	Excellent
The strategic intervention material has real-life application or problem-solving scenarios to enhance interests of the learners.	3.97	Excellent	3.82	Excellent
The strategic intervention material has gamified elements or visuals used to increase motivation.	3.90	Excellent	3.64	Excellent
Average	**3.93**	**Excellent**	**3.73**	**Excellent**

ITEMS	**Respondents**			
	Teachers		**Experts**	
Assessment and Feedback	**WM**	**Verbal Description**	**WM**	**Verbal Description**
The strategic intervention material has formative assessments to check the understanding of the	3.95	Excellent	3.91	Excellent

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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

learners.				
The strategic intervention material includes answer keys, rubrics, or feedbacks loops.	3.92	Excellent	3.82	Excellent
The strategic intervention material helps to track learners' progress and mastery.	3.90	Excellent	3.64	Excellent
Average	**3.92**	**Excellent**	**3.79**	**Excellent**

Legend: 3.25- 4.00 Excellent; 2.50- 3.24 Good; 1.75 – 2.49 Adequate; 1.00- 1.74 Weak

Content Knowledge and Accuracy

The respondents' evaluation of the Developed Strategic Intervention Materials (SIM) in Fundamentals of Polynomials for Grade 8 based on content knowledge and accuracy as shown in Table 5 was described as "Excellent" with an overall weighted mean of 3.91 from Mathematics teachers and 3.81 from expert validators. The tabulated data shows that the statement with the highest weighted mean from Mathematics teachers based on content knowledge and accuracy is "The content is aligned with the learning competencies in the grade 8 mathematics curriculum such as MELCs or PPST-aligned indicators." (wm=3.93) and the statement with the lowest weighted mean is "The strategic intervention material targets the specific mathematics skills identified as areas of difficulty." (wm=3.88). When

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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

it comes to the validation of expert-validators in content knowledge and accuracy, the statement with the highest weighted mean is "The content is aligned with the learning competencies in the grade 8 Mathematics curriculum such as MELC's or PPST-aligned indicators." (wm=3.91) and the statement that received the lowest weighted mean is "The strategic intervention material targets the specific Mathematics skills identified as areas of difficulty." (wm=3.73).

According to the evaluation results based on Content Knowledge and Accuracy, the developed Strategic Intervention Material (SIM) in Fundamentals of Polynomials for Grade 8 was rated as Excellent by both math teachers and expert-validators. These results demonstrate that the developed Strategic Intervention Material has a high level of content validity and accurately reflects the intended mathematical concepts, learning competencies, and curriculum standards. The course material is appropriate for use in the classroom and can effectively help students understand the principles of polynomials, according to both groups' consistently high ratings.

International Research Journal of Education and Technology (IRJEdT)
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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

"The content is aligned with the learning competencies in the Grade 8 Mathematics curriculum such as MELCs or PPST-aligned indicators" received the highest rating among Math teachers. This finding suggests that the respondents were aware of the SIM's close adherence to the necessary curriculum requirements. Curriculum alignment is a fundamental component of high-quality teaching materials because it ensures that learning experiences directly contribute to the attainment of expected competencies. The results indicate that the developed SIM effectively supports teachers in delivering instruction that conforms to the Department of Education's curriculum requirements.

By identifying the same indicator as having the highest weighted mean, the expert-validators further verified that the content of the SIM is consistent with both the Most Essential Learning Competencies (MELCs) and established educational standards. By proving that the instructional material was carefully developed to meet the Grade 8 Mathematics learning objectives, the agreement between experts and math teachers increases the material's credibility. The consistency between practitioner and

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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

expert evaluations demonstrates the material's instructional soundness and content validity.

However, the indicator "The strategic intervention material targets the specific Mathematics skills identified as areas of difficulty" received the lowest weighted mean from both math teachers and expert-validators. Although these ratings fall short of the other indicators, they are still in the Excellent descriptive category, suggesting potential for improvement. The respondents may have believed that more focus should be placed on intervention activities that focus on the most common misconceptions and learning gaps in polynomial concepts, even though the SIM generally satisfies learners' needs. In order to ensure that the educational activities specifically target areas of mathematical difficulty, this finding highlights how important it is to continuously improve intervention materials based on students' performance in the classroom and the test results.

The ratings of math teachers and expert-validators vary slightly, which may be due to their disparate

backgrounds and points of view. Math teachers, who are the ultimate users of the teaching resources, may evaluate the SIM primarily based on how well it functions in the classroom and how easy it is to use. Conversely, expert-validators may employ more stringent standards for instructional design, curriculum alignment, and content accuracy. The slight variation in their ratings, however, indicates that there is a high degree of agreement regarding the overall quality of the developed SIM.

The current findings are consistent with recent studies that highlighted the benefits of curriculum-aligned Strategic Intervention Materials for improving math learning. Thus, by ensuring that intervention activities remained focused on the critical skills identified by the Department of Education, MELC-based teaching resources enhanced students' conceptual understanding and academic performance. These findings demonstrate how important it is to develop learner-responsive and curriculum-based intervention materials.

International Research Journal of Education and Technology (IRJEdT)
	ISSN: 2581-7795, Impact Factor 5.007	
	Peer-Reviewed	Open Access	International Journal	
	Volume: 09	Issue: 09	Sep- 2026	www.irjweb.com	

Likewise, Department of Education Order No. 12, s. 2020 was created to guarantee that instruction would remain relevant, high-quality, and consistent despite changes in the curriculum. Every educational resource should closely align with the Most Essential Learning Competencies (MELCs). By guaranteeing that the instructional content directly addresses the competencies expected of Grade 8 learners, the developed SIM's high ratings show that it complies with this national policy. This alignment helps teachers implement competency-based mathematics instruction and raises the content's instructional value.

Recent empirical data also support the effectiveness of Strategic Intervention Materials in improving math performance. Our daily lives involve mathematics in one form or another. One of the most challenging subjects for educators to teach in the classroom is mathematics. For fourth graders who have trouble understanding the subject, some teachers use Strategic Intervention Material (SIM) to teach these fundamental mathematical operations. The four fundamental mathematical operations are addition, subtraction, multiplication, and division. The process was

International Research Journal of Education and Technology (IRJEdT)
	ISSN: 2581-7795, Impact Factor 5.007	
	Peer-Reviewed	Open Access	International Journal	
	Volume: 09	Issue: 09	Sep- 2026	www.irjweb.com	

taught to the student at a lower grade level, but it wasn't fully ingrained in their minds, so they struggled when they moved up to a higher grade. However, in order to concentrate on students' understanding and application of basic mathematical concepts, educators have taken the initiative to develop SIM.

According to Toquero (2020), teachers can help students master their least-learned competencies by using strategic intervention materials. Students who struggled to grasp the premise of the subject were given it. It can improve teachers' ability to instruct their charges and help students with their responses (Castalone, 2019).

According to Aranda et al. (2019), SIM assisted students in mastering the competency and corrected those who have trouble understanding the lesson. Students who received instruction in the traditional manner did not perform as well as those who used Strategic Intervention Materials (SIM). Balazo (2021) also found that using SIM outperformed those taught through traditional instruction. Ramos (2019) found that students performed better in

International Research Journal of Education and Technology (IRJEdT)
‖ ISSN: 2581-7795, Impact Factor 5.007 ‖
‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

mathematics when strategic intervention materials were used. Students could learn competency-based skills that they would not be able to learn in a traditional classroom by using the Strategic Intervention Material (SIM). It was one strategy used by the Department of Education to raise student achievement (De Jesus, 2019).

Additionally, the department publishes several memos for instructors who are participating in SIM (Strategic Intervention Materials) training. For the current educational blended learning system, a project named Strategic Intervention Materials was developed (Dimou, 2021). Students learned from the project and took part in engaging class discussions (De Roxas, 2019). Using an interactive whiteboard and a printer, the teacher gave students tangible activity sheets to complete (Riconalla et al., 2022). This helped students learn and made their studies more pleasurable by providing them with useful and interesting printed materials (Cabello, 2022). The strategic intervention materials concentrated on the least-mastered skills and were clear, easy to comprehend, and repeatable. They also ensured that the activities matched

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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

the tasks or objectives, kept them brief and straightforward, and provided a range of activities to suit different learning styles (Bahinting et al., 2022). Lastly, they ensured that the activities were appropriate for the tasks or goals (Apiong, 2021).

The findings are also supported by UNESCO (2021), which emphasized that effective learning recovery materials should be competency-focused, evidence-based, and responsive to learners' actual learning gaps, particularly in mathematics following educational disruptions. Additionally, UNESCO recommended that intervention materials be updated frequently using data from classroom assessments to keep instructional activities responsive to students' evolving educational needs. This recommendation is consistent with the respondents' observation that although the developed SIM has excellent content quality, its instructional effectiveness could be further improved by focusing more intently on specific learner challenges.

Overall, the findings demonstrate that the created Strategic Intervention Material contains extremely precise

International Research Journal of Education and Technology (IRJEdT)
‖ ISSN: 2581-7795, Impact Factor 5.007 ‖
‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

and superior content. Both math teachers and expert-validators have acknowledged the content's strong curriculum alignment, indicating that it has the potential to be a valuable supplemental teaching resource for Grade 8 mathematics. However, it could be more effective and contribute to improving students' mastery of polynomial concepts if it focuses more on specific learner challenges.

Learner Appropriateness

The respondents' evaluation of the developed Strategic Intervention Materials (SIM) in Fundamentals of Polynomials for Grade 8 based on learner appropriateness as shown in Table 5 was described as "Excellent" with an overall weighted mean of 3.93 from Mathematics teachers and 3.73 from expert-validators. The tabulated data shows that the statement with the highest weighted mean from mathematics teachers based on learner appropriateness is "The strategic Intervention Material caters to diverse learning styles such as visual, kinesthetic, and linguistic." (wm=3.95) and the statement with the lowest weighted mean is "The strategic intervention material is culturally and contextually relevant to the learners." (wm=3.92). When it

International Research Journal of Education and Technology (IRJEdT)
‖ ISSN: 2581-7795, Impact Factor 5.007 ‖
‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

comes to the validation of expert-validators in learner appropriateness, the statement with the highest weighted mean is "The strategic intervention material caters to diverse learning styles such as visual, kinesthetic, and linguistic." (wm=3.82) and the statement that received the lowest weighted mean is "The strategic intervention material is designed at the appropriate grade level and cognitive load." (wm=3.64).

According to the respondents' evaluation based on Learner Appropriateness, both math teachers and expert-validators rated the developed Strategic Intervention Material (SIM) in Fundamentals of Polynomials for Grade 8 as Excellent. These findings demonstrate that the developed SIM has instructional features that consider the cognitive abilities, learning preferences, and developmental needs of Grade 8 students, making it highly appropriate for the target learners. Positive evaluations from both respondent groups show that the material has a lot of potential to increase student interest and enhance understanding of polynomial concepts.

International Research Journal of Education and Technology (IRJEdT)
‖ ISSN: 2581-7795, Impact Factor 5.007 ‖
‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

"The strategic intervention material caters to diverse learning styles such as visual, kinesthetic, and linguistic" was the most highly rated indicator among Math teachers. This finding suggests that the respondents recognized the educational material's ability to address the different ways in which students take in and process information. The use of multiple learning modalities is considered an essential part of effective instructional materials because it promotes deeper conceptual understanding, increases learner participation, and accommodates individual differences. According to the results, the created SIM provides a range of teaching methods and educational exercises that enable students with different learning styles to participate fully in the educational process.

Similarly, the expert-validators identified the same indicator as the highest-rated statement. The consistency between math teachers and expert-validators supports a widely held belief that the SIM successfully integrates instructional strategies that support diverse learners. Such agreement increases the instructional credibility of

International Research Journal of Education and Technology (IRJEdT)
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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

the material and demonstrates that its design reflects learner-centered principles consistent with contemporary mathematics education. The SIM combines practical exercises, language-based explanations, and visual aids to help students understand abstract mathematical concepts like polynomials.

On the other hand, math teachers gave the indicator "The strategic intervention material is culturally and contextually relevant to the learners" the lowest weighted mean. Respondents believed that there was still room for improvement in terms of contextualizing mathematical activities and problems in light of the learners' local experiences, surroundings, and culture, even though this rating is still in the Excellent descriptive category. Contextualization is an important teaching strategy because students generally understand mathematical concepts better when lessons are connected to familiar real-life situations. By supporting localized examples and actual community-based applications, the teaching content's relevance and significance may be further enhanced.

International Research Journal of Education and Technology (IRJEdT)
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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

The expert-validators gave "The strategic intervention material is designed at the appropriate grade level and cognitive load" the lowest rating. Although it is still considered Excellent, this comparatively lower rating implies that experts may have discovered ways to enhance the sequence of activities, simplify some explanations, or adjust the level of difficulty of learning tasks to better fit the cognitive readiness of Grade 8 students. The cognitive load theory states that in order to maximize comprehension and reduce unnecessary mental effort, educational materials should carefully balance the amount of information presented to students. Therefore, simplifying instructions, establishing learning tasks gradually, and scaffolding challenging concepts may further improve the SIM's instructional efficacy.

Expert-validators' and Math teachers' ratings differ slightly, which could be explained by their different evaluation philosophies. While expert-validators typically use more stringent criteria related to instructional design, developmental appropriateness, and educational theory, Math teachers are more likely to evaluate the

International Research Journal of Education and Technology (IRJEdT)
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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

material based on its practicality, classroom usability, and learner engagement. Despite these variations, both respondent groups consistently gave the developed SIM an Excellent learner appropriateness rating, indicating strong agreement about its suitability for students in Grade 8.

In order to account for learner variability, the results also support the Universal Design for Learning (UDL) Guidelines Version 3.0 developed by CAST (2024), which recommend providing students with a range of ways to engage, represent, and express themselves. These concepts are reflected in the developed SIM, which uses guided language explanations, visual aids, and interactive exercises that accommodate learners' different skill levels and preferences to present mathematical concepts. In a similar vein, UNESCO (2021) emphasized that inclusive and flexible learning materials should make use of a range of instructional techniques that increase student engagement and improve learning results. These international frameworks stress the importance of developing mathematics intervention materials that address learner diversity rather than relying exclusively on one teaching method.

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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

Students' mathematical comprehension, motivation, and success are significantly impacted by the complex idea of learner engagement in numeracy. Research demonstrates how technological, familial, educational, and environmental elements work together to promote engagement. While Dizon and Gonzales (2023) found that students with kinesthetic learning preferences and higher engagement levels performed better in mathematics, Sonnenschein and Galindo (2023) highlighted the positive role of family involvement in fostering early numeracy. Active and interactive approaches, such as game-based instruction and play-based learning, have been shown to boost participation and enthusiasm, particularly when resources are scarce. Institutional initiatives to implement active learning strategies boost participation and success (Association of Public and Land-grant Universities, 2020), and strong teacher-student relationships and supportive learning environments further foster engagement and success (Darling-Hammond et al., 2019). Technology plays a significant role in engagement as well. Wulandari and Putri (2022) found that digital game-based interventions improved

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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

motivation and numeracy outcomes, while Bond, Bedenlier, Marín, and Hölel (2020) and Fredricks, Filsecker, and Lawson (2016) demonstrated that interactive and collaborative models fostered emotional and cognitive involvement. Kong (2021) offered more proof that structured, tech-assisted teamwork enhanced critical thinking and problem-solving abilities.

According to Bragas (2025), project-based, collaborative, and hands-on activities effectively enhanced numeracy skills, especially in applying operations and reasoning. All things considered, these studies showed that interactive and interesting learning activities can effectively support the growth of numeracy abilities. Even though students show a solid foundation, continued practice, problem-solving exercises, and reasoning-focused interventions are required to enhance their skills and ensure mastery in all areas of mathematics.

Causing, Araquil, Baldove, and Toreno (2024) found that using concrete manipulatives made from locally accessible materials in the Philippines, like stones and

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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

banana leaves, improved students' engagement and numeracy skills in a variety of domains. These studies lend credence to the idea that contextualized learning strategies improve students' conceptual comprehension and promote active participation, making numeracy instruction more relevant and effective for them.

Contextualized learning strategies make abstract concepts more applicable and meaningful by relating mathematical concepts to learners' prior knowledge and real-world experiences. Goos, Dole, and Geiger (2016) emphasized that situating numeracy within everyday contexts improved understanding and problem-solving skills, while Geiger et al. (2019) and Allen, Smith, Brown, and Miller (2024) found that real-life and scenario-based tasks improved reasoning, retention, and performance. While Rashid and Yeo (2020), Cavanagh (2019), and Niemi and Multisilta (2016) confirmed that project-based, hands-on, and technology-integrated strategies deepened comprehension and motivation, Cakiroglu and Cakiroglu (2018) and Abdullah and Lim (2017) showed that collaborative and everyday context learning enhanced critical thinking and the

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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

transfer of mathematical skills. According to Tindowen, Bassig, and Cagurangan (2017), integrating local contexts enhanced student engagement in Philippine classrooms. Contextualized and interactive instruction fosters meaningful learning and mathematical reasoning, according to Wardana et al. (2023) and Lo and Hew (2021).

Critical thinking and mathematical literacy are positively impacted by problem-based learning, using manipulatives, and incorporating local culture, according to research. Pratama and Yelken (2024) found that ethno-mathematics-based learning significantly improved students' mathematical literacy, which is consistent with the study's integration of local culture. In line with the outcomes of problem-solving activities, Sholihah (2025) claimed that problem-based learning in cultural contexts greatly enhanced mathematical literacy. A study carried out in the Philippines by Causing at al. (2024), which showed that using local materials for hands-on learning, such as snail shells and bamboo sticks, improved numeracy skills, supports the findings of the current manipulative study.

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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

Colango (2024) found that the use of manipulatives enhanced students' procedural fluency and conceptual comprehension.

Additionally, a meta-analysis by Mauladaniyati et al. (2024) demonstrated that adding local culture significantly improved mathematical comprehension, which is in line with the results of this study.

Overall, the findings demonstrate the high level of learner appropriateness of the developed Strategic Intervention Material. Its ability to support a range of learning styles was consistently acknowledged by math teachers and expert-validators, indicating its adherence to learner-centered instructional principles. However, by enhancing the contextual relevance of learning activities and further honing the cognitive demands of selected tasks, the SIM's instructional quality may be strengthened and its effectiveness in meeting the learning needs of Grade 8 students studying fundamental concepts in polynomials may be increased.

International Research Journal of Education and Technology (IRJEdT)
‖ ISSN: 2581-7795, Impact Factor 5.007 ‖
‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

Clarity of Instructional Design

The respondents' evaluation of the developed Strategic Intervention Materials (SIM) in Fundamentals of Polynomials for Grade 8 based on clarity of instructional design as shown in Table 5 was described as "Excellent" with an overall weighted mean of 3.91 from mathematics teachers and 3.73 from expert-validators. The tabulated data shows that the statement with the highest weighted mean from mathematics teachers based on clarity of instructional design is "The strategic intervention material has guided examples, practice tasks, and feedback mechanisms." (wm=3.95) and the statement with the lowest weighted mean is "The strategic intervention material's layout and sequencing are logical and user-friendly." (wm=3.87). When it comes to the validation of expert-validators in clarity of instructional design, the statement with the highest weighted mean is "The strategic intervention material has guided examples, practice tasks, and feedback mechanisms." (wm=3.82) and the statement that received the lowest weighted mean is "The strategic intervention material's

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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

layout and sequencing are logical and user-friendly." (wm=3.64).

Both Math teachers and expert-validators rated the developed Strategic Intervention Material (SIM) in Fundamentals of Polynomials for Grade 8 as Excellent, according to the respondents' validation based on Clarity of Instructional Design. These results show that the developed SIM exhibits a high degree of instructional clarity and effective design, allowing students to comprehend the lessons, follow the activities methodically, and complete the learning tasks with little difficulty. Both respondent groups consistently gave the instructional material high ratings, indicating that it has learner-friendly features and well-structured content that support efficient mathematics instruction.

"The strategic intervention material has guided examples, practice tasks, and feedback mechanisms" was the indicator that math teachers rated the highest. This result suggests that the inclusion of instructional components that support step-by-step learning and reinforce students'

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‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

understanding through guided practice and prompt feedback was highly valued by the respondents. Guided examples and practice exercises are essential components of effective mathematics instruction because they help students gradually improve their procedural fluency and conceptual understanding while providing them with timely feedback to clear up any misunderstandings. The results show that the developed SIM effectively incorporates instructional scaffolds that encourage self-directed learning and increase students' self-assurance in their capacity to solve polynomial problems.

The expert-validators' identification of the same indicator as the highest-rated statement also demonstrated agreement on the SIM's instructional efficacy. Math teachers and expert-validators concur that the material provides sufficient opportunities for practice, guided learning, and performance assessment. These instructional features are particularly important in mathematics intervention materials because they enable struggling learners to master concepts through repeated application

International Research Journal of Education and Technology (IRJEdT)
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	Peer-Reviewed	Open Access	International Journal	
	Volume: 09	Issue: 09	Sep- 2026	www.irjweb.com	

while receiving structured support throughout the learning process.

However, both respondent groups gave the indicator "The layout and sequencing of the strategic intervention material are logical and user-friendly" the lowest ratings. Despite being in the Excellent descriptive category, both ratings show that the content's organization and presentation could still be improved. The relatively lower evaluation may indicate areas that could be improved to make the content even more user-friendly for students, such as the visual organization of the content, the order of the learning activities, or the overall navigation. Logical lesson progression and an approachable layout are essential because they reduce learner confusion, facilitate more seamless transitions between concepts, and encourage sustained engagement throughout the instructional process.

The slight difference between the evaluations of math teachers and expert-validators may be explained by the divergent perspectives of the two respondent groups. Math teachers may have assessed the SIM primarily on its

International Research Journal of Education and Technology (IRJEdT)
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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

usability during classroom instruction and its ability to support student learning, whereas expert-validators likely examined the content using recognized principles of instructional design, visual organization, and educational quality standards. Despite these differences in opinion, both groups consistently agreed that the developed SIM has excellent instructional clarity and overall design quality, which strengthens the validity of the developed intervention material.

The importance of logical sequencing and user-friendly instructional design is supported by recent educational research. Section 12 of DepEd Order No. 2020 emphasizes that learning materials developed in accordance with the Most Essential Learning Competencies (MELCs) should exhibit logical progression, clarity of presentation, and learner-friendly organization to support effective teaching and self-directed learning.

Authentic materials are prepared and developed by teachers, who play a major role in the educational process. This is true whether the materials are included in a

International Research Journal of Education and Technology (IRJEdT)
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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

textbook or created by the school. In addition to serving as the foundation for students' extracurricular and in-class activities, they can serve as the primary information source for instruction and learning. The educational materials offer practical and efficient means of accomplishing the objectives set forth by a program or organization.

As stated by Manurung (2017), the preparation of instructional materials is intended to create materials that can serve as resources for effective learning. Since the purpose of the instructional preparation is to create effective learning, then it is suggested that the writer of the instructional materials begin the preparation and the writing of the instructional materials by understanding the stated goal in the curriculum and then seek to create a set of activities that enable that goal to be reached.

The developed instructional objectives serve as the basis for the development of instructional materials. In order to achieve what is expected of a learner as a result of instruction, the instructional materials translate the

International Research Journal of Education and Technology (IRJEdT)
‖ ISSN: 2581-7795, Impact Factor 5.007 ‖
‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

instructional objectives that are taught during in-person instruction. To put it another way, the program's well-prepared and designed instructional materials aid in achieving its goal. As a result, it is strongly advised—as was suggested in the preceding section—that the developed instructional materials be based on the instructional objective that has been formulated in the school syllabus (Manurung, 2017).

Furthermore, the findings align with Mayer's (2021) Cognitive Theory of Multimedia Learning, which explains that instructional materials are more effective when information is presented in a way that is coherent, well-organized, and visually balanced. Mayer claims that unnecessary visual complexity and disarray increase extraneous cognitive processing, which reduces learners' ability to understand new concepts. Similarly, in order to lessen learning barriers and enable students to independently navigate instructional materials, CAST's Universal Design for Learning (UDL) Guidelines Version 3.0 (2024) recommend delivering educational content in formats that are comprehensible, consistent, and accessible. These

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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

concepts could be incorporated into the developed SIM to further enhance its educational efficacy and usability.

Overall, the findings demonstrate the excellent instructional design and clarity of the developed Strategic Intervention Material. The consistently high ratings given by math teachers and expert-validators show that the SIM effectively supports learner understanding through guided examples, structured practice, and appropriate feedback mechanisms. However, by making improvements to the layout, visual organization, and learning activity sequencing, the material's usability and instructional efficacy could be further increased. These enhancements can aid in the development of more engaging and approachable intervention materials that can satisfy the diverse learning needs of eighth-grade students studying polynomial fundamentals.

Engagement and Motivation

The respondents' evaluation of the developed Strategic Intervention Materials (SIM) in Fundamentals of Polynomials for Grade 8 based on engagement and motivation as shown in Table 5 was described as "Excellent" with an overall weighted mean of 3.93 from mathematics teachers and 3.73

International Research Journal of Education and Technology (IRJEdT)
‖ ISSN: 2581-7795, Impact Factor 5.007 ‖
‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

from expert-validators. The tabulated data shows that the statement with the highest weighted mean from mathematics teachers based on engagement and motivation is "The strategic intervention material has real-life application or problem-solving scenarios to enhance interests of the learners." (wm=3.97) and the statement with the lowest weighted mean is "The strategic intervention material has gamified elements or visuals used to increase motivation." (wm=3.90). When it comes to the validation of expert-validators in engagement and motivation, the statement with the highest weighted mean is "The strategic intervention material has real-life application or problem-solving scenarios to enhance interests of the learners." (wm=3.82) and the statement that received the lowest weighted mean is "The strategic intervention material has gamified elements or visuals used to increase motivation." (wm=3.64).

Both math teachers and expert-validators rated the developed instructional material as Excellent, according to the respondents' validation of the Strategic Intervention Material (SIM) in Fundamentals of Polynomials for Grade 8 based on Engagement and Motivation. These results show that

International Research Journal of Education and Technology (IRJEdT)
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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

the SIM successfully integrates instructional elements that encourage students' motivation, engagement, and interest in learning the basic ideas of polynomials. The material's ability to produce meaningful and captivating learning experiences that motivate students to actively participate in mathematics learning is suggested by the consistently high ratings from both groups.

"The strategic intervention material has real-life application or problem-solving scenarios to enhance the interests of the learners" was the most highly rated indicator among math teachers. This result implies that the respondents valued the SIM's incorporation of real-world scenarios and contextualized problem-solving exercises. Learners' interest and willingness to participate in the lesson are increased when mathematical concepts are connected to real-life experiences. This helps them understand the relevance and utility of mathematics in everyday situations. The outcome suggests that the developed SIM effectively contextualizes polynomial concepts through real-world applications that enhance the

International Research Journal of Education and Technology (IRJEdT)
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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

meaning and comprehension of abstract mathematical concepts.

Similarly, the expert-validators found the same indicator as the statement with the highest rating, indicating that there is widespread agreement regarding the effectiveness of the instructional material in promoting learner engagement through contextualized learning experiences. This consensus demonstrates that both practitioners and instructional specialists value practical problem-solving exercises that foster critical thinking and the practical application of mathematical knowledge. These findings validate the learner-centered design of the SIM and its compatibility with contemporary approaches to teaching mathematics that place an emphasis on relevance and experiential learning.

Conversely, the indicator "The strategic intervention material has gamified elements or visuals used to increase motivation," was rated lowest by both respondent groups. These ratings show that gamification features and motivational visual elements could still be improved, even

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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

though they are still in the Excellent descriptive category. The respondents may have thought that more interactive features, such as educational games, reward systems, colorful visual organizers, badges, or technology-assisted activities, could increase students' motivation and sustained engagement during instruction, even though the content already included engaging teaching elements.

Their different methods for assessing instructional materials may account for the small disparity between the evaluations of math teachers and expert-validators. Math teachers may have focused on the visible student engagement during classroom implementation, while expert-validators likely evaluated the SIM using well-established instructional design principles and modern educational innovations. The relatively small difference between their overall ratings, however, indicates that there is a high degree of agreement that the developed SIM effectively motivates learners while maintaining instructional quality.

Recent studies emphasizing the growing importance of educational gamification in math education are supported by

International Research Journal of Education and Technology (IRJEdT)
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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

the relatively lower ratings for gamified components. Research indicates that employing interactive visuals, game-based learning strategies, and motivational rewards can reduce math anxiety while increasing student engagement, perseverance, and enjoyment. Adding more gamified components could increase the SIM's ability to maintain students' motivation throughout the intervention process, even though it already demonstrates a high level of learner engagement.

The outcomes also align with the Department of Education's Learning Recovery Program (DepEd Order No. 13, s. 2023), which promotes the use of learner-centered and contextualized intervention materials to close learning gaps and actively engage students in meaningful learning experiences. The policy states that by connecting lessons to real-world scenarios and providing engaging learning opportunities that develop higher-order thinking skills, instructional interventions should increase student motivation. The developed SIM reflects these concepts by including problem-solving activities that are directly related to students' everyday experiences. Recent research

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‖ ISSN: 2581-7795, Impact Factor 5.007 ‖
‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

on education supports this observation. Sailer and Homer (2020) found that gamification enhanced learners' behavioral, cognitive, and motivational outcomes, particularly when game elements were successfully integrated into educational activities. According to their research, badges, points, progress tracking, and immediate feedback significantly boosted students' motivation and perseverance during academic tasks.

Similarly, Zainuddin et al. (2020) discovered that gamified learning environments improved student engagement, enjoyment, self-efficacy, and academic achievement because they created interactive learning experiences that encouraged sustained participation. These studies suggest that increasing the number of gamified components in the developed SIM could increase its motivational efficacy while maintaining its educational value.

Additionally, UNESCO (2021) emphasized that post-pandemic learning recovery requires educational materials that actively engage students through learner-centered, interactive, and technology-supported approaches.

International Research Journal of Education and Technology (IRJEdT)
‖ ISSN: 2581-7795, Impact Factor 5.007 ‖
‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

Educational materials should stimulate students' interest, encourage engagement, and sustain their motivation throughout the teaching process in addition to providing accurate content. These recommendations corroborate the respondents' conclusion that the SIM's effectiveness as a math intervention tool might be improved by including more gamified and interactive visual elements.

According to Mwakapenda (2004), one of the most important traits associated with educational goals is understanding of concepts, which includes mastering specific knowledge, learning new skills, and developing critical thinking abilities. The capacity to identify links or relationships between previously learned concepts is known as understanding. Understanding concepts is crucial in this situation since they form the foundation for achieving the goals. Maynard (2019) defines comprehension as the ability to draw connections between ideas rather than just being aware of specific facts. Concepts, according to Darling-Hammond et al. (2022), are intricate ideas that are essential for directing instruction and promoting learning (Cheung et al., 2021). Concepts are

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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

actually crucial to learning because they are categories or abstractions that help people organize and interpret information (Guizzardi et al., 2021). Concepts provide a framework for understanding new information by relating it to existing knowledge, claim Antunes and Pinheiro (2020). Deep learning and problem-solving require the ability to connect and apply concepts.

Finally, the findings demonstrate a high level of motivation and engagement in the developed Strategic Intervention Material. Both math teachers and expert-validators consistently acknowledge the material's effective use of real-life applications and contextualized problem-solving, demonstrating how well the SIM promotes meaningful and active mathematics learning. However, using more gamified instructional elements and interactive visual components could increase student motivation, engagement, and overall effectiveness. These enhancements make the SIM a more engaging and learner-centered intervention tool that can satisfy the learning needs of eighth-grade students studying polynomial fundamentals.

International Research Journal of Education and Technology (IRJEdT)
‖ ISSN: 2581-7795, Impact Factor 5.007 ‖
‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

Assessment and Feedback

The respondents' evaluation of the developed Strategic Intervention Materials (SIM) in Fundamentals of Polynomials for Grade 8 based on assessment and feedback as shown in Table 5 was described as "Excellent" with an overall weighted mean of 3.92 from mathematics teachers and 3.79 from expert-validators. The tabulated data shows that the statement with the highest weighted mean from mathematics teachers based on assessment and feedback is "The strategic intervention material has formative assessments to check the understanding of the learners." (wm=3.95) and the statement with the lowest weighted mean is "The strategic intervention material helps to track learners' progress and mastery." (wm=3.90). When it comes to the validation of expert-validators in assessment and feedback, the statement with the highest weighted mean is "The strategic intervention material has formative assessments to check the understanding of the learners." (wm=3.91) and the statement that received the lowest weighted mean is "The strategic intervention material helps to track learners' progress and mastery." (wm=3.64).

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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

Both math teachers and expert-validators rated the developed Strategic Intervention Material (SIM) in Fundamentals of Polynomials for Grade 8 as Excellent, according to the respondents' validation based on Assessment and Feedback. These results show that the developed SIM successfully integrates assessment techniques and feedback systems that assist students in tracking their comprehension, spotting misunderstandings, and enhancing their grasp of polynomial concepts. The consistently high ratings from both respondent groups show that the SIM's assessment component is in line with good teaching methods and greatly enhances the intervention's overall efficacy.

"The strategic intervention material has formative assessments to check the understanding of the learners" was the indicator that math teachers rated the highest. This result implies that the respondents valued the formative assessment activities that were incorporated into the course materials. Formative assessments are essential to the teaching-learning process because they give teachers and students instant access to information about students' comprehension, enabling them to spot misconceptions before

International Research Journal of Education and Technology (IRJEdT)
‖ ISSN: 2581-7795, Impact Factor 5.007 ‖
‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

moving on to more difficult ideas. The outcome suggests that rather than only assessing performance at the conclusion of a lesson, the developed SIM successfully incorporates opportunities for ongoing assessment that enhance learning during instruction.

The expert-validators' identification of the same indicator as the highest-rated statement further demonstrated strong agreement regarding the quality of the formative assessment components included in the instructional material. This consistency between math teachers and expert-validators demonstrates that the SIM provides students with appropriate opportunities to evaluate their comprehension and receive prompt assistance. Formative assessments increase the instructional value of the SIM by enabling teachers to make informed decisions about instruction and helping students identify their areas of strength and growth.

However, the indicator "The strategic intervention material helps to track learners' progress and mastery" received the lowest weighted mean from both math teachers

International Research Journal of Education and Technology (IRJEdT)
‖ ISSN: 2581-7795, Impact Factor 5.007 ‖
‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

and expert-validators. Despite being in the Excellent descriptive category, these ratings show that there is still room for improvement in the systems used to monitor learner progress over time. The respondents might have thought that even though the SIM effectively assesses students' immediate comprehension through formative exercises, it could be improved to document students' learning progress throughout the intervention period using extra tools for tracking progress, such as mastery checklists, learner progress charts, self-assessment forms, rubrics, or performance tracking records.

The slight differences in ratings between math teachers and expert-validators may be attributed to their divergent perspectives on assessment methods. Math teachers may have evaluated the SIM based on its applicability and usefulness in routine classroom instruction, whereas expert-validators may have used more comprehensive standards pertaining to assessment design, learner monitoring, and educational evaluation. The relatively small difference in the overall weighted means indicates that, despite these differences, there is broad consensus

International Research Journal of Education and Technology (IRJEdT)
	ISSN: 2581-7795, Impact Factor 5.007	
	Peer-Reviewed	Open Access	International Journal	
	Volume: 09	Issue: 09	Sep- 2026	www.irjweb.com	

that the developed SIM displays high-quality assessment and feedback components appropriate for teaching mathematics to eighth graders.

The comparatively lower ratings on learner progress tracking also highlight an important component in the development of intervention materials. According to educational assessment literature, effective intervention programs should incorporate systematic progress-monitoring tools that enable teachers to evaluate learner development over time and the effectiveness of instructional interventions. Learner portfolios, competency progress charts, mastery tracking sheets, and reflective assessment exercises could all be used to enhance the SIM's assessment component and provide more comprehensive evidence of student achievement.

These findings are corroborated by recent studies that highlight the importance of formative assessment in Strategic Intervention Materials and mathematics education. Wisniewski et al. (2020) found through a comprehensive meta-analysis that one of the most important factors

International Research Journal of Education and Technology (IRJEdT)
‖ ISSN: 2581-7795, Impact Factor 5.007 ‖
‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

influencing student achievement was timely, targeted feedback that is closely related to learning objectives. According to their research, students can identify knowledge gaps, take charge of their own learning, and improve their academic performance with the help of formative evaluation and insightful feedback. In a similar vein, Panadero (2021) explained that formative assessment encourages students to monitor their progress, think about their understanding, and determine how to improve their learning strategies in order to promote self-regulated learning. These findings corroborate the respondents' positive evaluations of the formative assessment and feedback mechanisms incorporated into the developed SIM.

Furthermore, the present results are consistent with Philippine educational policies. Formative assessment is a key component of the Department of Education's National Learning Recovery Program (DepEd Order No. 13, s. 2023), which aims to identify learning gaps, monitor student progress, and provide timely remediation. The policy encourages teachers to use intervention materials that include continuous assessment and timely feedback to ensure

International Research Journal of Education and Technology (IRJEdT)
‖ ISSN: 2581-7795, Impact Factor 5.007 ‖
‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

that students achieve the Most Essential Learning Competencies (MELCs). The developed SIM reflects these recommendations by including formative assessment activities that let students continuously assess their comprehension while allowing teachers to provide the required instructional support.

The importance of systematic learner progress monitoring is also emphasized in contemporary educational literature. According to OECD (2021), in order to provide reliable evidence of student development and inform instructional decision-making, effective assessment systems should incorporate formative assessment with continuous progress monitoring. Similarly, UNESCO (2021) emphasized that intervention materials designed for learning recovery should include mechanisms that not only assess learning outcomes but also continuously monitor learner progress in order to ensure timely instructional modifications and customized support. These international recommendations corroborate the respondents' observation that enhancing learner progress-tracking mechanisms would further boost the developed SIM's efficacy.

International Research Journal of Education and Technology (IRJEdT)
‖ ISSN: 2581-7795, Impact Factor 5.007 ‖
‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

Lastly, according to the evaluation and comments, the developed Strategic Intervention Material is of a high caliber. The consistently high ratings from math teachers and expert-validators demonstrate how well the SIM integrates formative assessments that support students' comprehension and reinforce mathematical concepts throughout the instructional process. However, the content's effectiveness as a thorough instructional intervention might be increased by including additional learner progress-monitoring and mastery-tracking tools. These improvements would ensure that the intervention greatly improves students' understanding of Grade 8 polynomial concepts and enable teachers and students to monitor learning progress more systematically.

Table 6

Significant Difference in the Evaluation of Mathematics Teachers and Experts in the Developed Strategic Intervention Material (SIM) in Fundamentals of Polynomials

International Research Journal of Education and Technology (IRJEdT)
‖ ISSN: 2581-7795, Impact Factor 5.007 ‖
‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

Developed Strategic Intervention Material (SIM)	Evaluators: Teachers (60) and Experts (12)	Interpretation
Content Relevance and Accuracy t-test Stat t Crit(2-tailed) N	 *1.44 2.14 Unequal	 No Significant Difference
Learner Appropriateness t-test Stat t Crit(2-tailed) N	 *1.64 2.18 Unequal	 No Significant Difference
Clarity of Instruction and Design t-test Stat t Crit(2-tailed) N	 *1.81 2.18 Unequal	 No Significant Difference
Engagement and Motivation t-test Stat t Crit(2-tailed) N	 *2.09 2.18 Unequal	 No Significant Difference
Assessment and Feedback t-test Stat t Crit(2-tailed) N	 *1.48 2.16 Unequal	 No Significant Difference

Table 6 presents the results of the independent samples t-test conducted to determine whether there was a significant difference between the evaluations of mathematics teachers (n=60) and expert-validators (n=12) regarding the developed Strategic Intervention Material (SIM) in Fundamentals of Polynomials for Grade 8. The findings revealed that there is "no significant difference"

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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

between the evaluations of Mathematics Teachers and Experts of the developed Strategic Intervention Material (SIM) in Fundamentals of Polynomials across all five evaluation criteria: Content Relevance and Accuracy (t = 1.44), Learner Appropriateness (t = 1.64), Clarity of Instruction and Design (t = 1.81), Engagement and Motivation (t = 2.09), and Assessment and Feedback (t = 1.48). Since the computed t-values were all lower than the critical t-values (2.14–2.18), the null hypothesis was accepted, indicating that the evaluations of mathematics teachers and expert-validators did not significantly differ.

The lack of significant differences suggests that the quality and instructional efficacy of the developed SIM were viewed similarly by math teachers and expert-validators. Despite differences in professional roles and evaluation perspectives, both groups consistently acknowledged that the instructional material had excellent qualities in terms of curriculum alignment, learner appropriateness, instructional clarity, learner engagement, and assessment quality. This convergence of evaluations improves the overall validity and credibility of the

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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

developed SIM because it demonstrates that the content satisfies both the expectations of classroom practitioners and expert standards for instructional resource development.

In terms of Content Relevance and Accuracy, the non-significant difference indicates that both respondent groups concurred that the SIM accurately reflected the Grade 8 Mathematics curriculum, presented mathematically correct concepts and procedures, and aligned with the Most Essential Learning Competencies (MELCs). Such agreement implies that the content of the instructional materials is sufficiently rigorous for expert evaluation while also being useful and practical for classroom implementation. This finding suggests that high-quality instructional materials should demonstrate both curriculum fidelity and content validity to ensure meaningful learning experiences.

Similarly, the lack of notable variations in Learner Appropriateness indicates that both math teachers and expert-validators thought the SIM was suitable for the cognitive abilities, learning preferences, and developmental characteristics of Grade 8 students.

International Research Journal of Education and Technology (IRJEdT)
‖ ISSN: 2581-7795, Impact Factor 5.007 ‖
‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

Furthermore, the consensus suggests that the concept presentation, learning tasks, and instructional activities effectively accommodate learner diversity while maintaining age-appropriate levels of complexity. These findings demonstrate that the SIM successfully integrates learner-centered teaching strategies in accordance with modern educational standards.

In a similar vein, the non-significant difference in Clarity of Instruction and Design indicates that both groups shared similar views regarding the structure, order, readability, and instructional flow of the content. The SIM provides learner-friendly instructional features, structured learning activities, guided examples, and clear instructions that support comprehension and independent learning, according to the respondents' consistent agreement. This finding suggests that the instructional design principles applied in the development of the SIM effectively support both classroom implementation and learner engagement.

The findings also demonstrated that there was no discernible difference in the motivation and engagement

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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

scores between math teachers and expert-validators. This result implies that both groups recognized the SIM's ability to pique students' interest through contextualized activities, real-world problem-solving scenarios, and engaging teaching strategies. Their agreement demonstrates the motivational aspects of the intervention material, which can increase students' active participation in mathematics learning while maintaining instructional relevance.

In a similar vein, the absence of significant differences in Assessment and Feedback indicates that both respondent groups understood the importance of the formative assessment activities and feedback mechanisms incorporated into the SIM. The assessment component successfully identifies misconceptions, encourages instructional improvement, and supports continuous monitoring of student understanding, according to teachers and experts. This agreement indicates that the developed SIM includes assessment practices that complement contemporary competency-based and learner-centered teaching approaches.

International Research Journal of Education and Technology (IRJEdT)
‖ ISSN: 2581-7795, Impact Factor 5.007 ‖
‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

The current findings are supported by recent research that emphasizes the importance of expert validation and teacher evaluation in the development of instructional materials. Academic performance is largely influenced by the instructional materials used. The teacher's ability to create educational materials that help students succeed academically is impressive. Because of the beneficial information exchange between the teacher and the student, learning can be enjoyable when this instructional material is available (Cinco, Caluza, Gotardo, Quisumbing & Verecio, 2017). The findings are also consistent with the Department of Education's Learning Resources Management and Development System (LRMDS), which emphasizes that subject matter experts and classroom teachers should assess learning resources before implementation to ensure content accuracy, curriculum alignment, instructional quality, and classroom applicability (Department of Education, 2020). The agreement between math teachers and expert-validators in this study indicates that the developed SIM successfully met these quality assurance standards.

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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

Furthermore, UNESCO (2021) emphasized that high-quality instructional materials should undergo a rigorous multi-stakeholder validation process involving both educational experts and end users to ensure that learning resources are technically sound, pedagogically appropriate, and responsive to learners' needs. The consistency of teacher and expert evaluations in this study supports UNESCO's recommendation that collaborative validation improve the reliability, credibility, and effectiveness of educational materials intended for classroom implementation.

Overall, the findings show that the developed Strategic Intervention Material has a consistently high level of quality, as shown by the lack of statistically significant differences between expert-validators' and math teachers' assessments. The results offer compelling proof that the SIM is both practically and pedagogically sound for teaching mathematics to eighth graders. The content validity, instructional quality, and general acceptability of the material are further strengthened by the convergence of expert and practitioner evaluations, supporting its

International Research Journal of Education and Technology (IRJEdT)
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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

potential use as an efficient supplemental instructional resource for enhancing learners' comprehension of polynomial concepts. The findings also imply that the rigorous development process employed in the SIM's design effectively addressed both theoretical and practical aspects of instructional material development. Consequently, the developed SIM can be considered a reliable and validated educational intervention that can help teachers address students' mathematical difficulties while promoting meaningful, engaging, and competency-based learning opportunities.

Recommendations to Improve the Developed Strategic Intervention Material (SIM) in Fundamentals of Polynomials for Grade 8.

In order to improve comprehension of the concept, there must be enough repetition through examples, illustrations, questions, and summaries, according to the advice of mathematics experts and teachers. In order to make the context more localized and easier for the students to understand, an additional Filipino-based illustration should be included. Every activity must also have a clearly

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‖ ISSN: 2581-7795, Impact Factor 5.007 ‖
‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

defined minimum level of technical proficiency. Every activity needs to have a substitute so that students can achieve all the goals with the least amount of technical expertise. The sources, especially the third-party materials used, must be properly cited. In order to prevent plagiarism, the Strategic Intervention Material (SIM) sources should be acknowledged and cited in the References. In order to align and integrate the activities with the lesson objectives and outcomes, sources may serve as a foundation. Equivalent substitutes for visual and auditory content must be included in the Strategic Intervention Material (SIM). For the learners to be able to read and see it, clear illustrations and language should be used. Every font style must be readable and give students choices.

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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

CHAPTER IV

Summary, Conclusions and Recommendations

Summary of Findings

Development of Strategic Intervention Material (SIM) in Fundamentals of Polynomials for Grade 8

A methodical, research-based process based on DepEd guidelines was used to create the Strategic Intervention Material (SIM) in Fundamentals of Polynomials for Grade 8. There were four main stages to the creation of the Strategic Intervention Material: planning, development, evaluation, and revision. Planning, needs analysis, least-mastered competency identification, content selection, instructional design, material preparation, and evaluation were all part of the process. Twelve competency-based SIMs that were in line with the Grade 8 Mathematics Curriculum Guide and MELCs were developed after a first quarter periodical test of 125 Grade 8 students revealed learning gaps in polynomial operations. In order to address identified learning difficulties, each SIM was created using the DepEd SIM format and featured learner-centered,

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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

contextualized, and interactive activities. Twelve experts in mathematics education and sixty math teachers evaluated the created materials, and their suggestions were implemented to enhance the instructional quality, design, and content. The finalized SIM was determined to be suitable, accurate, and responsive to the Fundamentals of Polynomials learning requirements of Grade 8 students.

Evaluation of Developed Strategic Intervention Materials (SIM) in Fundamentals of Polynomials

Content Relevance and Accuracy

In terms of content knowledge and accuracy, both math teachers and expert-validators gave the developed Strategic Intervention Material (SIM) in Fundamentals of Polynomials for Grade 8 an Excellent rating. The Most Essential Learning Competencies (MELCs) and PPST-aligned indicators, in particular, were highly aligned with the Grade 8 Mathematics curriculum, according to both groups, indicating strong content validity and instructional quality. According to this consensus, the SIM can improve students' comprehension of polynomial concepts and is suitable for use in the classroom.

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	ISSN: 2581-7795, Impact Factor 5.007	
	Peer-Reviewed	Open Access	International Journal	
	Volume: 09	Issue: 09	Sep- 2026	www.irjweb.com	

Curriculum alignment, which emphasizes the SIM's conformity to the Department of Education's competency-based standards, was cited by both respondent groups as its best feature. This result implies that the content helps teachers provide instruction that is accurate, pertinent, and in line with the desired learning objectives. The developed material's credibility and instructional soundness are further reinforced by the consistency between the assessments of math teachers and expert-validators.

The results are in line with recent research that highlights how curriculum-aligned Strategic Intervention Materials enhance mathematics learning by guaranteeing that instructional activities concentrate on critical competencies and learners' needs. The findings also corroborate the Department of Education's policy regarding the application of the Most Essential Learning Competencies (MELCs), which highlights the need for instructional materials to be competency-based, pertinent, and learner-responsive. Prior research also demonstrated how Strategic Intervention Materials can improve Math achievement by filling in learning gaps and reiterating basic ideas.

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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

Overall, the results showed that the created SIM was a reliable and useful supplemental teaching resource for Grade 8 mathematics; however, more improvement in addressing particular learner challenges may boost its overall efficacy.

Learner Appropriateness

In terms of learner appropriateness, both math teachers and expert-validators gave the developed Strategic Intervention Material (SIM) in Fundamentals of Polynomials for Grade 8 an Excellent rating. The results showed that the educational content was very appropriate for the cognitive capacities, learning preferences, and developmental traits of Grade 8 students. Through learner-centered instructional strategies, both groups agreed that the SIM has a strong potential to improve students' comprehension of polynomial concepts and increase learner engagement.

The SIM's strongest feature, according to both Math teachers and expert-validators, was its capacity to support a variety of learning styles, especially visual, kinesthetic, and linguistic approaches. This result shows

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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

that by offering a variety of learning activities and instructional strategies that encourage active engagement and meaningful learning, the teaching materials successfully address individual learner differences. The SIM's instructional credibility is further reinforced by the consistency of both groups' evaluations, which also demonstrate the program's alignment with inclusive and learner-centered educational principles.

The results support recent research that highlights how learner-centered Strategic Intervention Materials improve mathematics instruction by supporting a variety of learning styles, encouraging active participation, and offering significant learning opportunities. The findings also align with educational principles that support the use of instructional materials that are developmentally appropriate, contextualized, and differentiated. All things considered, the created SIM exhibits a high degree of learner appropriateness and can function as a useful supplemental teaching tool for mathematics in grade 8. However, it may be even more effective in meeting the learning needs of diverse learners if contextualized

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‖ ISSN: 2581-7795, Impact Factor 5.007 ‖
‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

learning activities are improved and cognitive demands are refined.

Clarity of Instructional Design

In terms of Clarity of Instructional Design, both math teachers and expert-validators gave the developed Strategic Intervention Material (SIM) in Fundamentals of Polynomials for Grade 8 an Excellent rating. The results showed that the educational content was well-structured, learner-friendly, and successfully aided students in comprehending lessons, finishing learning tasks, and grasping polynomial concepts through precise and organized instruction.

The SIM's strongest features, according to both respondent groups, were its practice tasks, guided examples, and feedback mechanisms. This implies that scaffolding strategies that support step-by-step learning, reinforce conceptual understanding, and give students enough practice opportunities and timely feedback are successfully incorporated into the instructional material. The SIM's instructional soundness and efficacy in promoting meaningful mathematics learning are further supported by the agreement between math teachers and expert-validators.

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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

The results showed that the created SIM had outstanding instructional clarity and design, which made it a useful additional teaching tool for math in grade 8. It successfully supports learner comprehension through the use of guided examples, structured practice, and feedback mechanisms; however, additional improvement to the layout, visual organization, and activity sequencing may improve its overall usability and instructional efficacy.

Engagement and Motivation

In terms of engagement and motivation, both math teachers and expert-validators gave the developed Strategic Intervention Material (SIM) in Fundamentals of Polynomials for Grade 8 an Excellent rating. The results showed that learner-centered strategies that piqued students' interest, motivate active engagement, and fostered meaningful mathematical learning experiences were successfully incorporated into the instructional materials.

The use of real-world applications and contextualized problem-solving scenarios was cited by both respondent groups as the SIM's best feature. In addition to improving conceptual understanding, critical thinking, and learner

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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

engagement, this indicates that the instructional material effectively links polynomial concepts to real-world scenarios, allowing students to see the value of mathematics in daily life. The consensus between math teachers and expert-validators provides additional evidence of how well contextualized learning fosters engaging and meaningful math instruction.

Overall, the results showed that the developed SIM had a high degree of motivational quality and engagement. It is a useful supplemental teaching tool for Grade 8 mathematics because of its successful integration of contextualized learning and real-world problem-solving exercises. However, increasing the use of interactive visual elements and gamified instructional features may improve learner motivation, engagement, and the intervention material's overall efficacy.

Assessment and Feedback

In terms of assessment and feedback, both math teachers and expert-validators gave the developed Strategic Intervention Material (SIM) in Fundamentals of Polynomials for Grade 8 an Excellent rating. The results showed that

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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

the teaching materials successfully incorporated evaluation techniques and feedback systems that assisted students in tracking their comprehension, spotting misunderstandings, and enhancing their grasp of polynomial concepts. The favorable assessments from both groups show that the assessment component improves the overall quality of the intervention material and facilitates effective teaching.

Formative assessments were found to be the SIM's best feature by both math teachers and expert validators. According to this research, the course material gives students ongoing chances to evaluate their comprehension while allowing teachers to spot learning gaps and offer prompt instructional support. The two groups' agreement further demonstrates how the formative assessment elements greatly enhance the SIM's instructional efficacy.

Generally, the results showed that the developed SIM had outstanding assessment and feedback quality, which made it a useful additional teaching tool for math instruction. Its efficient use of formative assessment promotes ongoing learning and strengthens students' comprehension of polynomial concepts, and the addition of more thorough

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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

learner progress-monitoring and mastery-tracking tools may increase its efficacy as an intervention tool.

Significant Difference in the Evaluation of Mathematics Teachers and Experts in the Developed Strategic Intervention Material (SIM) in Fundamentals of Polynomials

The five evaluation criteria—content relevance and accuracy, learner appropriateness, clarity of instructional design, engagement and motivation, and assessment and feedback—showed no discernible difference between the assessments of math teachers and expert-validators of the developed Strategic Intervention Material (SIM) in Fundamentals of Polynomials, according to the results of the independent samples t-test. The null hypothesis' acceptance suggests that both groups had similar opinions about the developed SIM's quality and efficacy as a teaching tool.

There appears to be broad agreement among math teachers and expert-validators that the SIM is curriculum-aligned, learner-centered, instructionally clear, engaging, and supported by suitable assessment and feedback mechanisms. Their agreement strengthens the instructional

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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

material's content validity, instructional quality, and overall credibility by demonstrating that it meets expert standards for instructional resource development as well as the expectations of classroom practitioners.

Recommendations To Improve the Developed Strategic Intervention Material (SIM) in Fundamentals of Polynomials for Grade 8.

A number of improvements were found to further improve the developed Strategic Intervention Material (SIM) based on the suggestions made by the expert-validators and math teachers. To strengthen students' comprehension of important ideas, these include offering more examples, illustrations, practice questions, and summaries. In order to make the learning activities more pertinent and significant for Grade 8 students, the respondents also suggested adding more localized, Filipino-based contexts.

In order to guarantee that all students, regardless of their technical abilities, can accomplish the desired learning outcomes, the respondents also recommended clearly defining the minimal technical skills needed for each task and offering substitute activities. In order to maintain

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‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

academic integrity and prevent plagiarism, they also stressed how crucial it is to correctly credit all references and acknowledge outside sources. Additionally, using reliable reference materials, instructional activities should be closely aligned with the lesson objectives.

The respondents suggested using clear illustrations and succinct language, choosing readable font styles that meet the various needs of learners, and providing equivalent substitutes for auditory and visual content in order to promote accessibility and inclusivity. These suggestions improve the developed SIM's quality, usability, and efficacy as a learner-centered educational tool.

Conclusions

1. The Strategic Intervention Material (SIM) in Fundamentals of Polynomials for Grade 8 was developed through a systematic, needs-based process using learners' least-mastered competencies as identified in the first quarter examination. The developed SIMs were aligned with the DepEd Self-Learning Module format and integrated contextualized, learner-centered, and

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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

competency-based activities. Thus, the development process produced instructional materials that are curriculum-aligned and responsive to the identified learning needs of Grade 8 learners.

2. The results showed that the Strategic Intervention Material (SIM) in Fundamentals of Polynomials for Grade 8 was rated as Excellent by both math teachers and expert-validators in terms of learner appropriateness, content accuracy, instructional design, engagement and motivation, assessment, and feedback. This shows that the developed SIM is instructionally appropriate, curriculum-aligned, and learner-centered. As a result, it could be a useful teaching tool for improving students' comprehension and proficiency of basic polynomial concepts.
3. The results showed no significant difference between the assessments of math teachers and expert-validators for each of the five evaluation criteria of the created Strategic Intervention Material (SIM) in Fundamentals of Polynomials for Grade 8. In terms of learner appropriateness, content relevance and

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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

accuracy, instructional design clarity, engagement and motivation, assessment, and feedback, it appears that both groups assessed the SIM's quality similarly.

4. As a result of thorough evaluation by the mathematics teachers and experts, the Strategic Intervention Material (SIM) in Fundamentals of Polynomials for Grade 8 was enriched in terms of content and its format to provide ease and a better learning experience for Grade 8 Mathematics learners. There were more localized examples and options. Improvements were made to the language, references, format, and font styles. To make it easier for students to apply the results in practical settings, the Strategic Intervention Material (SIM) was incorporated into other lessons.

Recommendations

1. School administration must prepare more technical trainings and workshops, like capacity-building activities on creating Strategic Intervention Material (SIM) for Mathematics so that more teachers will be

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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

encouraged to develop innovative and creative instructional materials.

2. The developed Strategic Intervention Material (SIM) in Fundamentals of Polynomials for Grade 8 Mathematics may have its overall quality enhanced by subjecting it to further validation and evaluation of the different groups of respondents to find out if it still conforms with the quality standards. It must also recognize that materials are not one-size-fits all; this means that right after the implementation, there is a need to re-examine materials and supplement as needed to address diverse students' interests and experiences.
3. The Strategic Intervention Material (SIM) in Fundamentals of Polynomials can also be used as a basis for developing other learning materials for Mathematics subject and other related disciplines. With this, effective learning will be possible because providing localized standard-aligned learning materials will help the learners understand the subject more deeply.

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‖ Peer-Reviewed | Open Access | International Journal ‖
‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

4. The enriched Strategic Intervention Material (SIM) in Fundamentals of Polynomials for Grade 8 may be adopted and continuously improved through regular validation, localization of learning activities, and integration of real-life applications to enhance learners' mathematical understanding and performance.

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‖ Volume: 09 | Issue: 09 | Sep- 2026 | www.irjweb.com ‖

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Appendix A

Instrument

Survey Questionnaire for Teacher-Respondents

Name (optional): _____ Age: _____ Sex: _____
School: _____
Position: _____ Civil Status:_____
Highest Educational Attainment: _____
Years in teaching the Subject: _____

This research study ought to develop and evaluate Strategic Intervention Materials in Mathematics 8. Further, this study entitled: **STRATEGIC INTERVENTION MATERIAL (SIM) IN FUNDAMENTALS OF POLYNOMIALS FOR GRADE 8.**

Directions: Please put a check (/) mark to the items that satisfy your answer. Kindly write the mark on the second column on the table presented below. Any information obtained in connection with this study can be identified will remain confidential.
The four-point scale shall be used wherein:

4- Excellent
3 - Good
2 - Adequate
1 - Weak

Indicators	4	3	2	1
Content Relevance and Accuracy				
1. The content is aligned with the learning competencies in the grade 8 mathematics curriculum such as MELC's or PPST-aligned indicators.				
2. The strategic intervention material targets the specific mathematics skills identified as areas of difficulty.				
3. The strategic intervention material's concepts are accurate and mathematically sound.				

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Learner Appropriateness				
1. The strategic intervention material is designed at the appropriate grade level and cognitive load.				
2. The strategic intervention material caters diverse learning style such as visual, kinesthetic, and linguistic.				
3. The strategic intervention material is culturally and contextually relevant to the learners.				
Clarity of Instructional Design				
1. The strategic intervention material's instructions are clear and easy to follow.				
2. The strategic intervention material's layout and sequencing are logical and user-friendly.				
3. The strategic intervention material has guided examples, practice tasks, and feedback mechanisms.				
Engagement and Motivation				
1. The strategic intervention material includes interactive/hands-on activities.				
2. The strategic intervention material has real-life application or problem-solving scenarios to enhance interests of the learners.				
3. The strategic intervention material has gamified elements or visuals used to increase motivation.				
Assessment and Feedback				
1. The strategic intervention material has formative assessments to check the understanding of the learners.				
2. The strategic intervention material includes answer keys, rubrics, or feedbacks loops.				
3. The strategic intervention material helps to track learners' progress and mastery.				

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Evaluation Tool Modified from Mathematics Intervention Materials' Evaluation Tool.

II. Directions: *Please write your observations, comments, suggestions and other concerns in evaluating Strategic Intervention Material (SIM) in fundamentals of polynomials for grade 8.*

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Appendix B

Sample Strategic Intervention Materials

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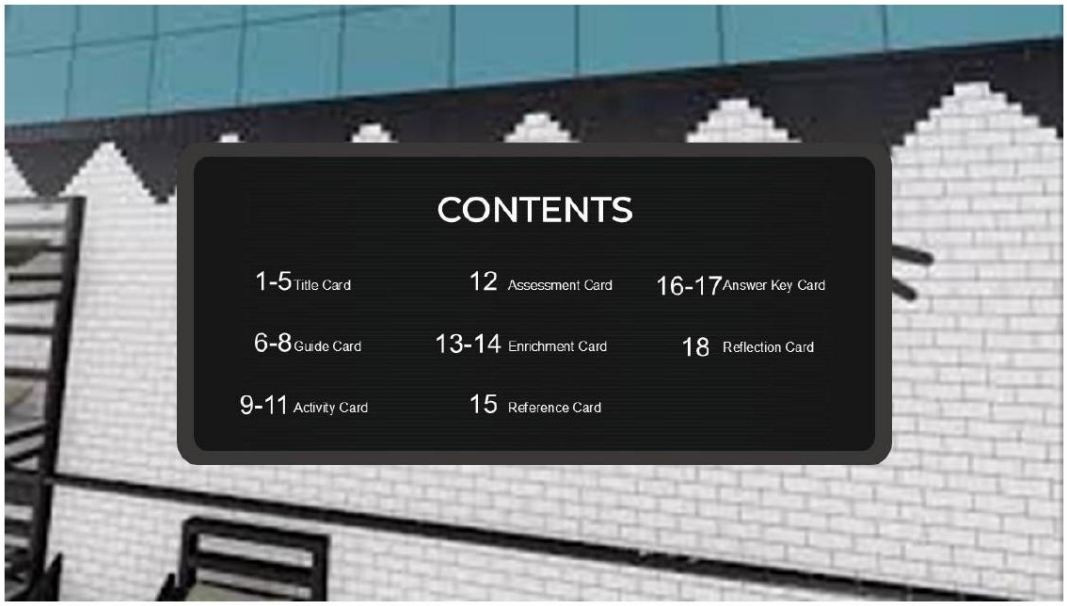

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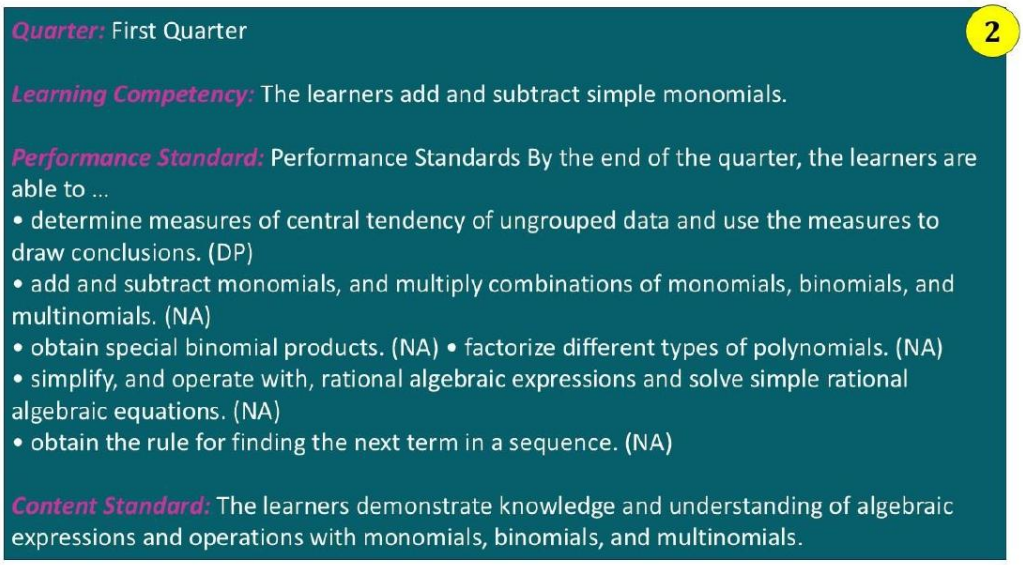

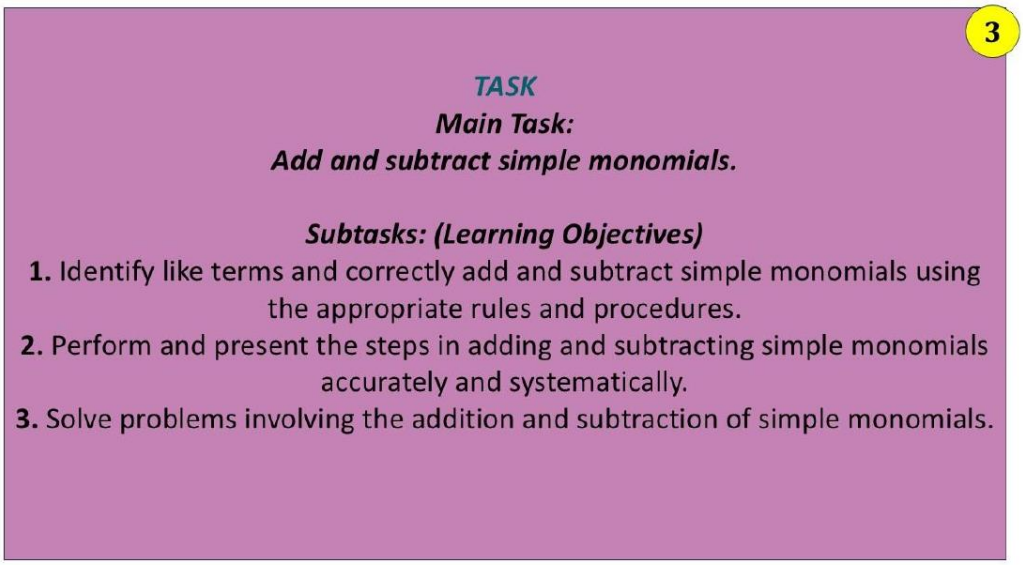

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4

An Overview

The Strategic Intervention Material (SIM) on *Addition and Subtraction of Simple Monomials* is designed to help Grade 8 learners develop a clear understanding of how to identify, combine, add, and subtract like terms involving simple monomials. It provides structured and engaging learning activities that address common difficulties encountered by learners in performing operations on algebraic expressions.

The material uses simple explanations, guided examples, interactive activities, and assessment tasks to make the lesson more accessible and meaningful. Through the different cards and activities, learners are given opportunities to strengthen their conceptual understanding, procedural skills, and confidence in working with monomials. The SIM also encourages learners to practice independently and apply their knowledge to simple mathematical situations.

The material is aligned with the learning competency "Add and subtract simple monomials." It focuses on helping learners recognize like terms, apply the rules for adding and subtracting monomials, and simplify algebraic expressions correctly. The activities are arranged from simple to more challenging tasks to provide gradual development of skills and accommodate learners who need additional support.

Overall, this Strategic Intervention Material serves as a supplementary learning resource that can assist learners in overcoming difficulties in adding and subtracting simple monomials. It aims to improve their mathematical understanding and computational skills while promoting accuracy, perseverance, and confidence in learning algebra.

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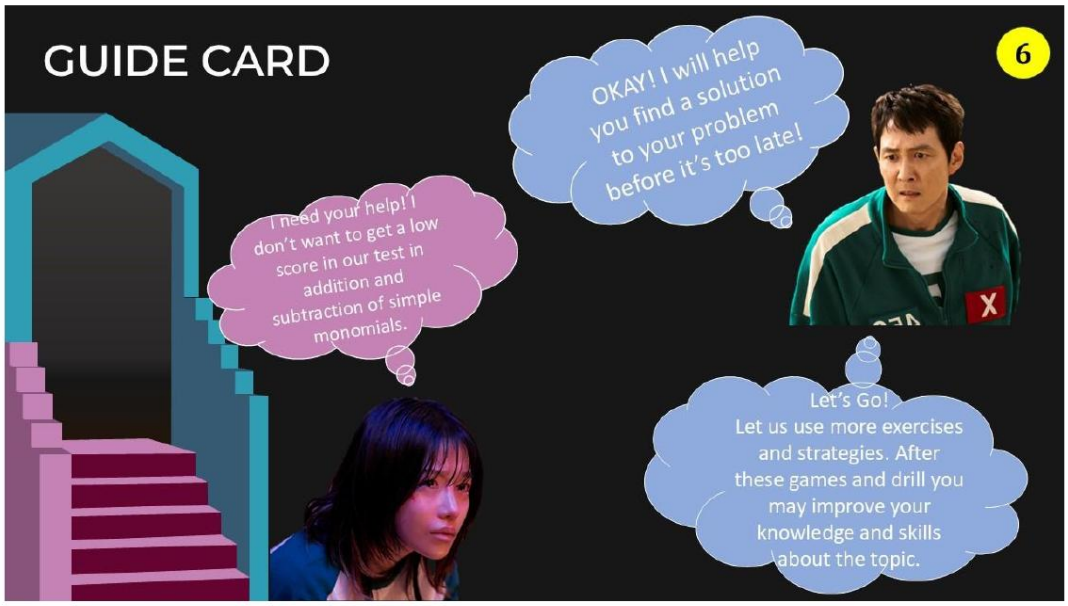

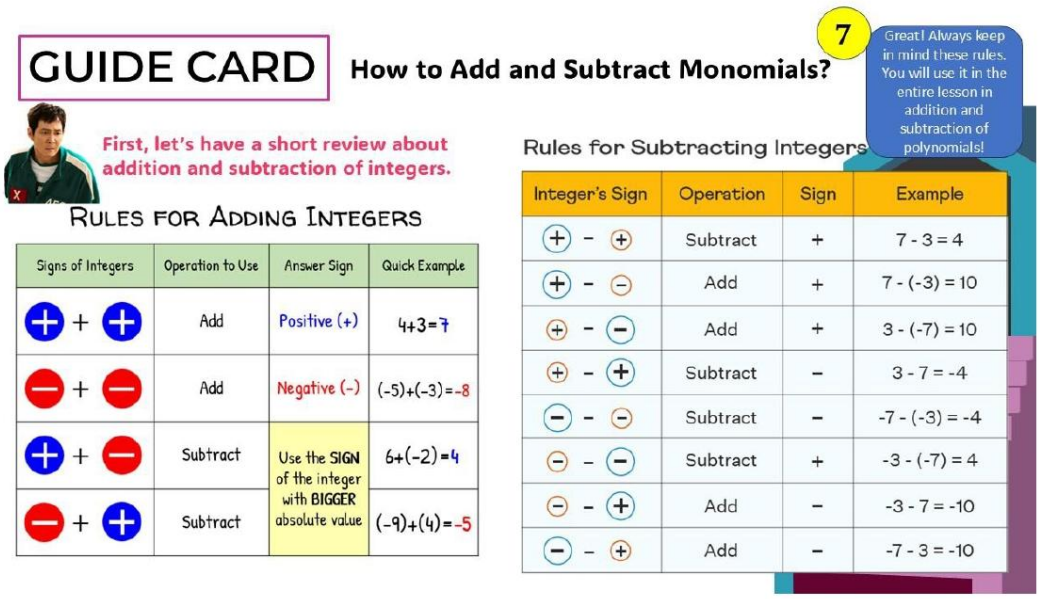

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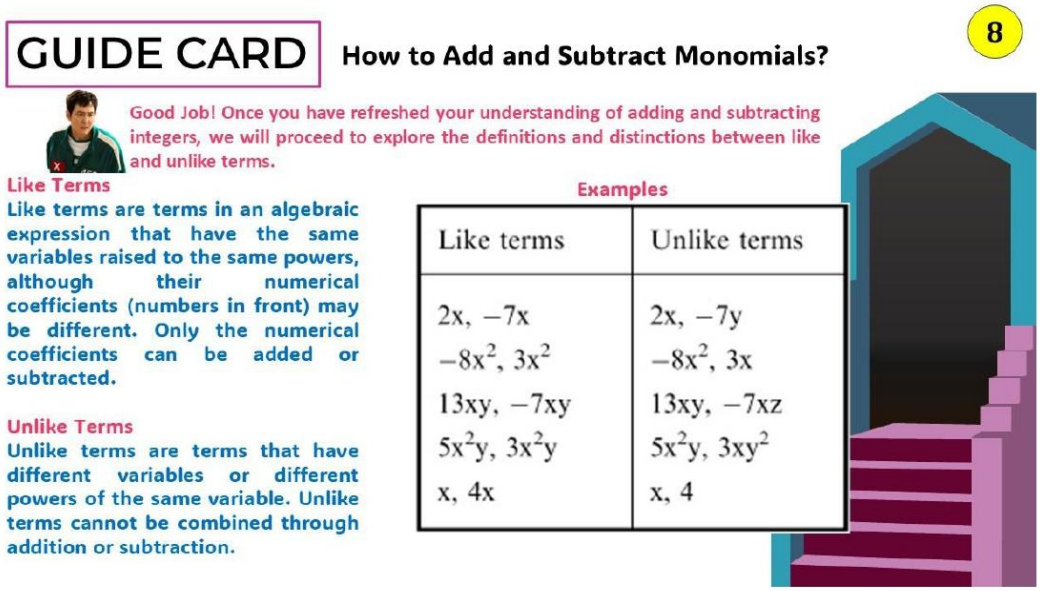

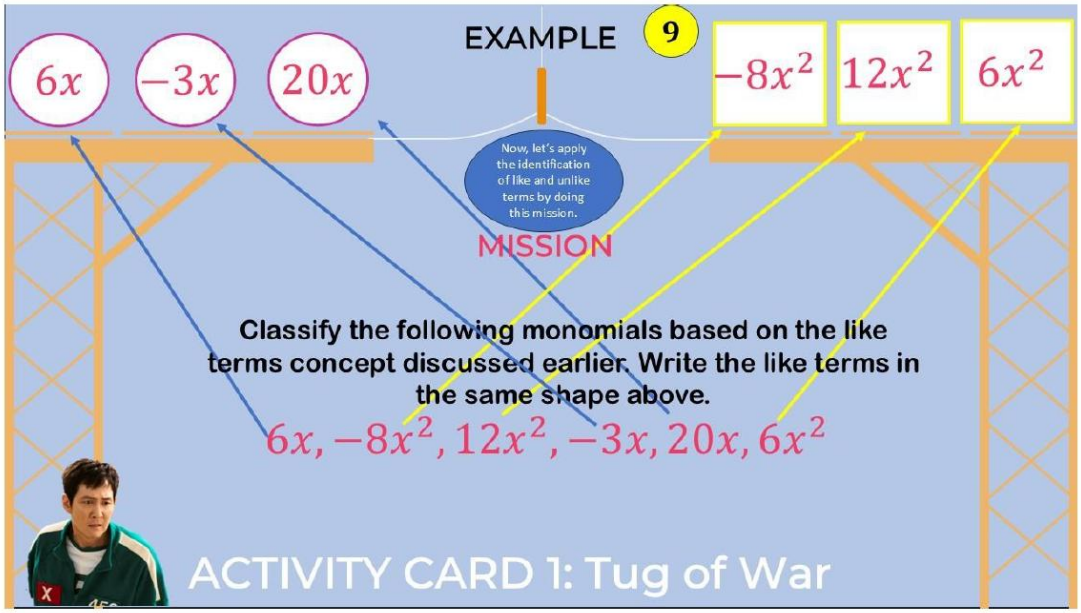

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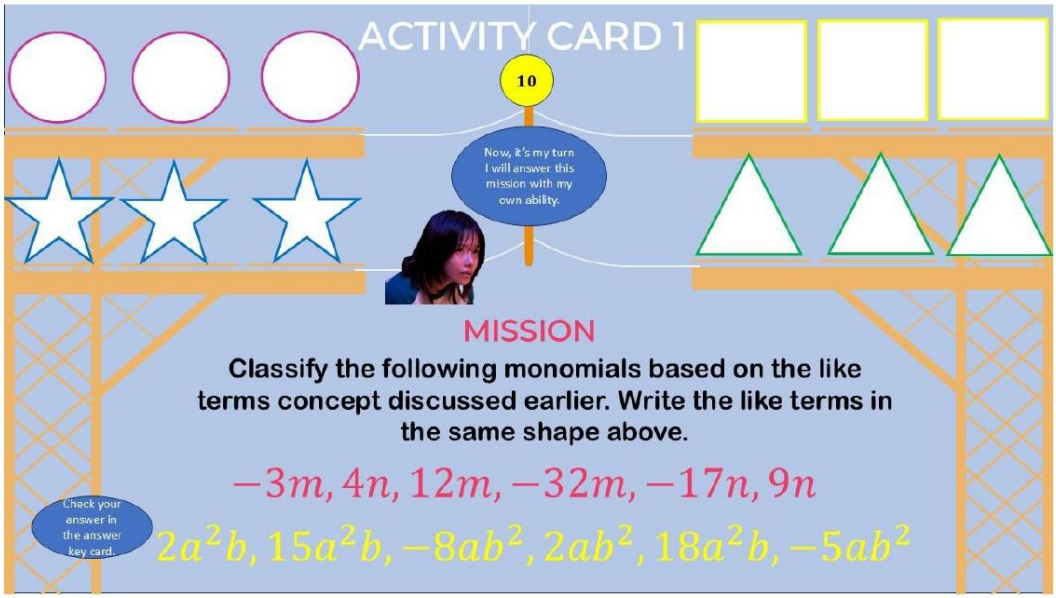

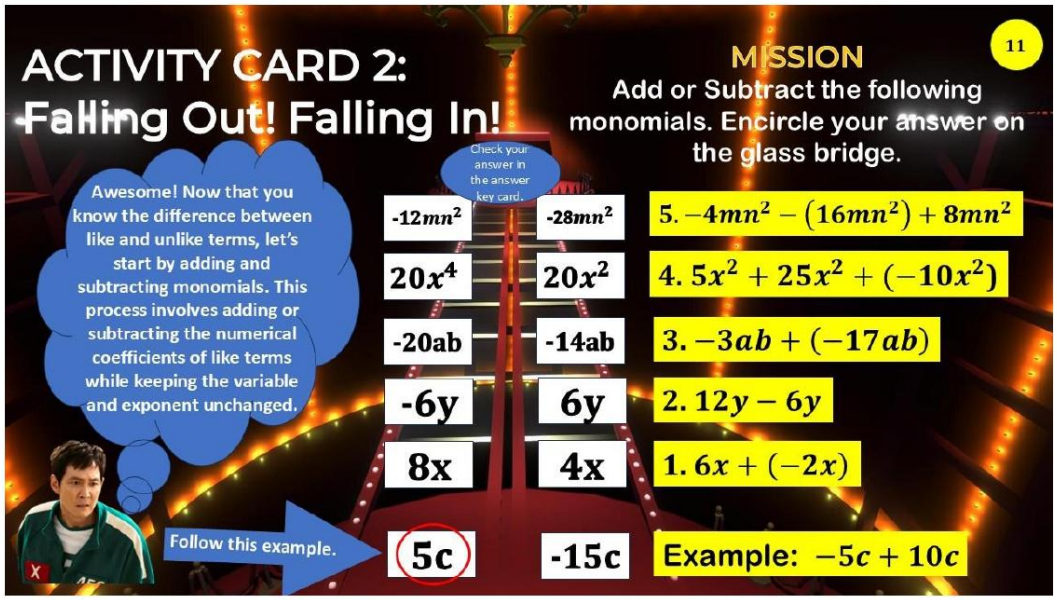

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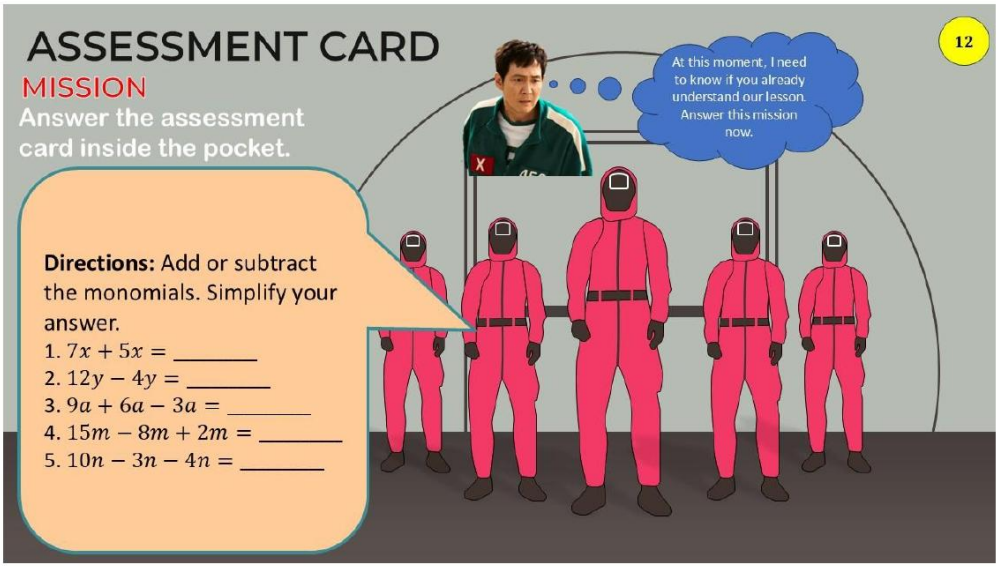

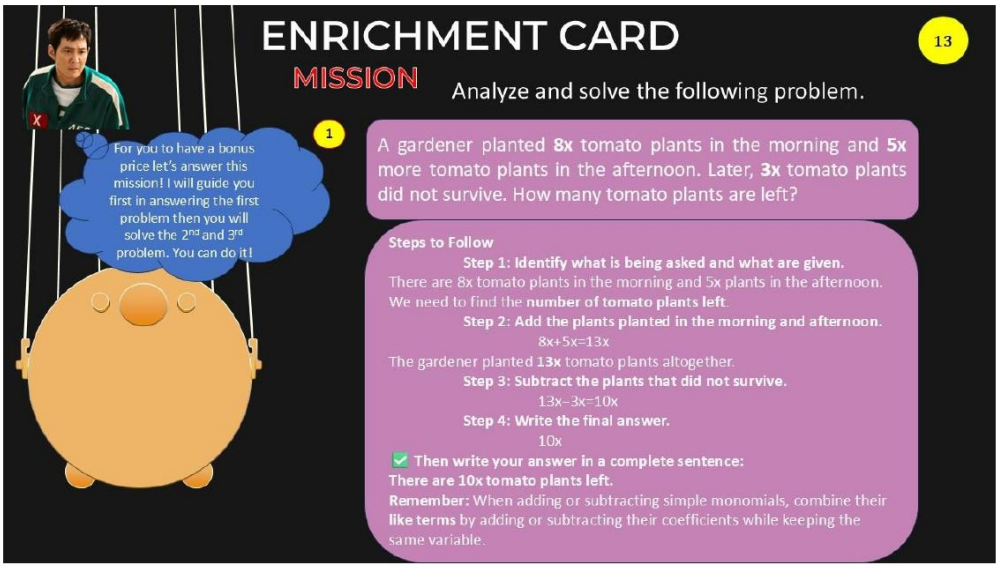

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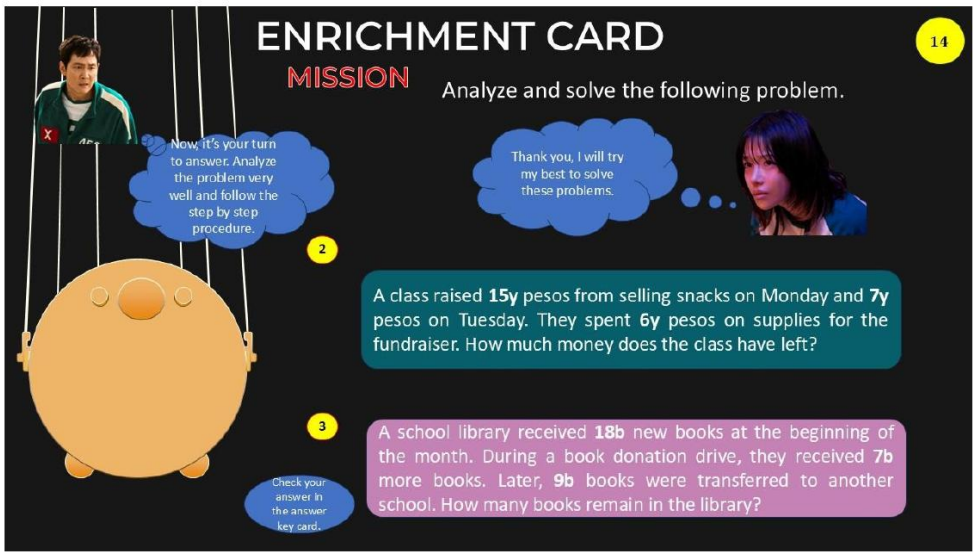

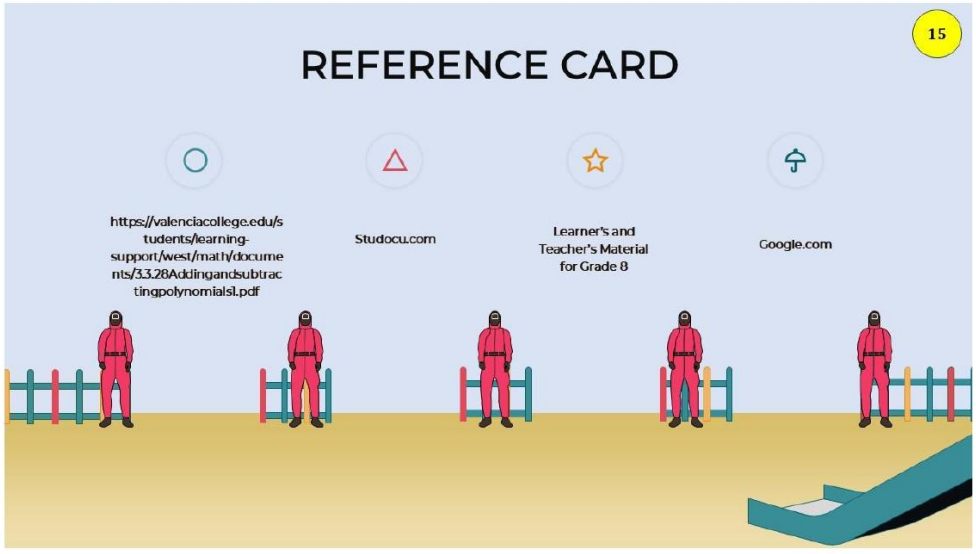

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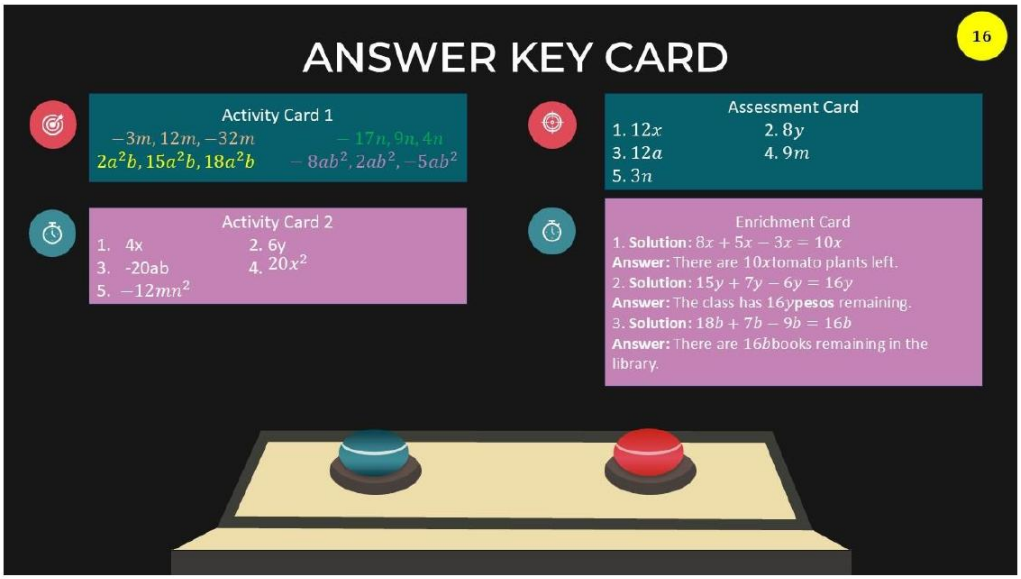

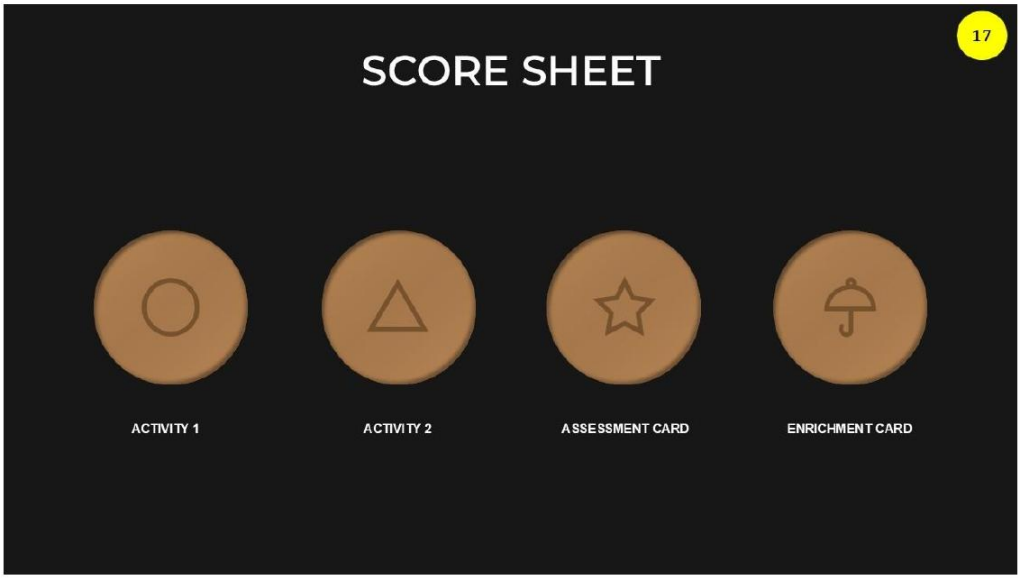

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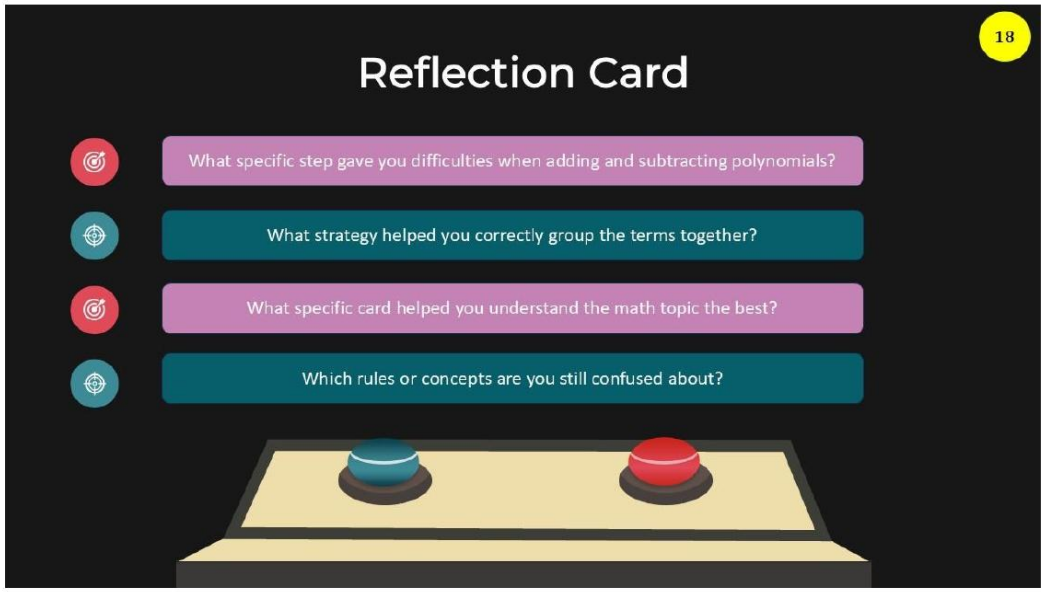

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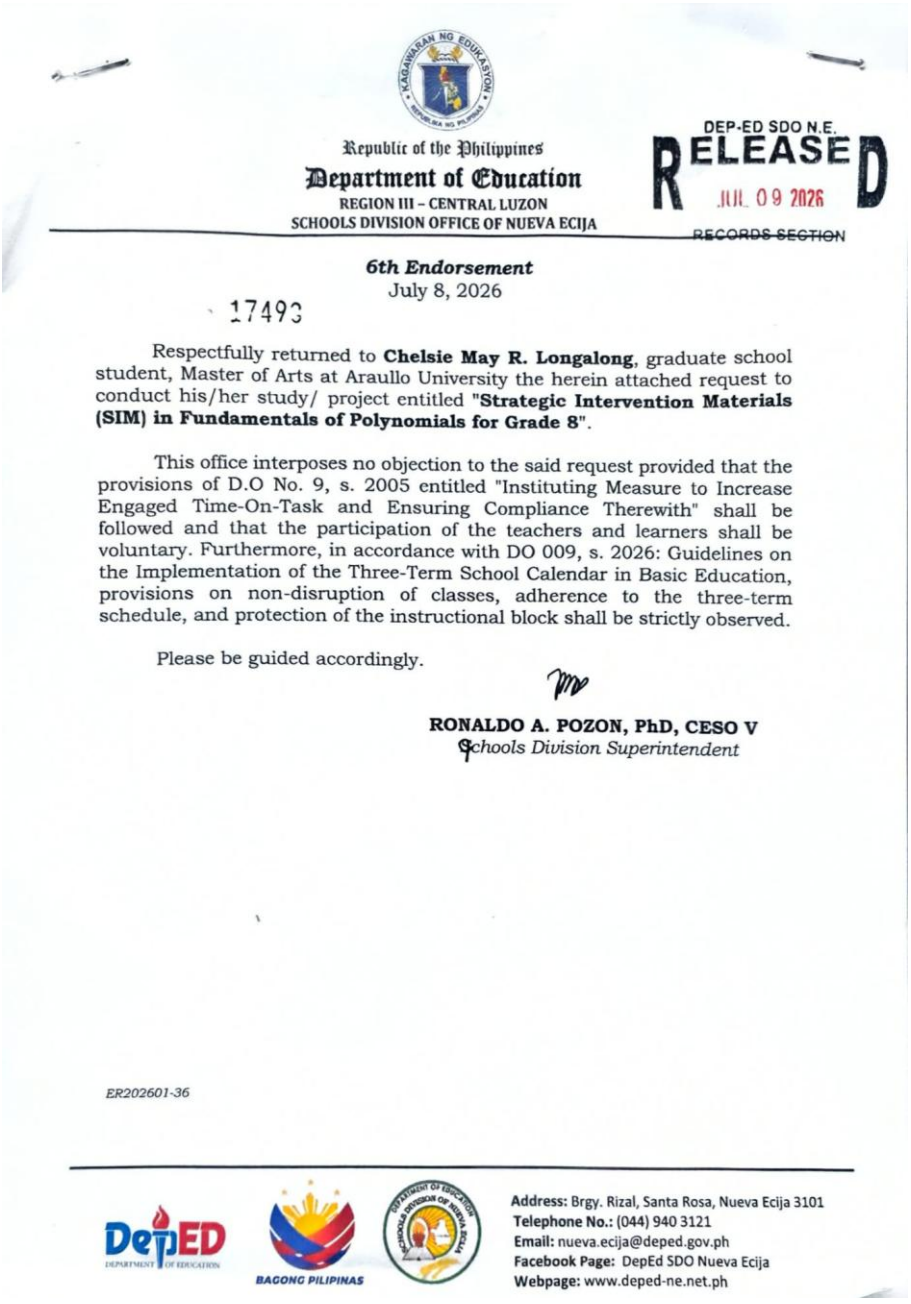
Appendix C

Letter of Approval

Office of the Schools Division of Nueva Ecija



Republic of the Philippines
Department of Education
REGION III – CENTRAL LUZON
SCHOOLS DIVISION OFFICE OF NUEVA ECIJA

DEP-ED SDO N.E.
RELEASED
JUL 09 2026
RECORDS SECTION

6th Endorsement
July 8, 2026

17493

Respectfully returned to **Chelsie May R. Longalong**, graduate school student, Master of Arts at Araullo University the herein attached request to conduct his/her study/ project entitled **"Strategic Intervention Materials (SIM) in Fundamentals of Polynomials for Grade 8"**.

This office interposes no objection to the said request provided that the provisions of D.O No. 9, s. 2005 entitled "Instituting Measure to Increase Engaged Time-On-Task and Ensuring Compliance Therewith" shall be followed and that the participation of the teachers and learners shall be voluntary. Furthermore, in accordance with DO 009, s. 2026: Guidelines on the Implementation of the Three-Term School Calendar in Basic Education, provisions on non-disruption of classes, adherence to the three-term schedule, and protection of the instructional block shall be strictly observed.

Please be guided accordingly.

RONALDO A. POZON, PhD, CESO V
Schools Division Superintendent

ER202601-36

DepED DEPARTMENT OF EDUCATION
BAGONG PILIPINAS

Address: Brgy. Rizal, Santa Rosa, Nueva Ecija 3101
Telephone No.: (044) 940 3121
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Appendix D

Letter of Approval

Office of the Schools Governance and Operations Division

July 7, 2026

Dear Mr/Ms.

ER202601-36	Chelsie May R. Longalong	Talavera North/ AU

Greetings!

This is a result of the evaluation conducted in the Planning and Research Unit.

TITLE of the Proposed Research
Strategic Intervention Materials (SIM) in Fundamentals of Polynomials for Grade 8

✓ *Follow the outline given below. The bullet points given are guide for enhancing the research. Provide the detailed discussion of each part of the paper.*

COMMENTS/ SUGGESTIONS:

✓ Recommended for approval.

Thank you!

ROWENA M. CASTILLO, PhD
Chief Education Supervisor
Schools Governance and Operations Division

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Appendix E

Curriculum Vitae

PERSONAL INFORMATION

Name : Chelsie May Ganaden Reyes-Longalong

Birthdate : May 26, 1995

Birthplace : Cabanatuan City, Nueva Ecija

Nationality : Filipino

Civil Status : Married

Address : #542 Purok 5, Bantug, Talavera, Nueva Ecija 3114

EDUCATIONAL BACKGROUND

Graduate Studies : Master of Arts Major in Mathematics
PHINMA – Araullo University
Cabanatuan City
January 2024 - present

Tertiary : Bachelor of Secondary Education
Major in Mathematics
Central Luzon State University
Science City of Muñoz, Nueva Ecija
April 2015

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Secondary : Talavera National High School
Pag-asa, Talavera, Nueva Ecija
March 2010

Elementary : Bantug Elementary School
Bantug, Talavera, Nueva Ecija
April 2006

GOVERNMENT EXAMINATIONS PASSED

Licensure Examination for Teachers
September 2015

WORK EXPERIENCES

Permanent Public School Teacher
Tabacao National High School
Tabacao, Talavera, Nueva Ecija
September, 2022 – present

Permanent Public School Teacher
Talavera National High School
Pag-asa, Talavera, Nueva Ecija
August, 2016 – September, 2020

Private Junior High School Teacher
San Sebastian School, Inc
Science City of Muñoz, Nueva Ecija
April 2015 – April 2016