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SEARCH, SOLVE, CREATE, AND SHARE (SSCS) MODEL IN FOSTERING CREATIVE PROBLEM-SOLVING OF GRADE 7 LEARNERS

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ABSTRACT :

Science education in the Philippines continues to face pressing challenges in equipping students with real-world creative problem-solving abilities. The purpose of this study was to determine the significant difference in the pre-assessment and post-assessment performance of Grade 7 learners in terms of their creative problem-solving skills, specifically in the areas of Creative Imagining, Making Inferences, Deriving Models, Synthesizing Ideas, and Flexibility in Thinking after the implementation of the Search, Solve, Create, and Share (SSCS) model. Furthermore, the study aimed to assess the delivery of lessons using the Search, Solve, Create, and Share (SSCS) model as evaluated through expert observations and student perceptions. This study employed a developmental research design, incorporating a quantitative approach through pre-test and post-test assessments. The respondents of the study consisted of 120 Grade 7 learners at Malinao Ilaya Integrated National High School. Based on the findings, learners' pre-assessment performance showed that most students were in the "Needs Improvement" to "Basic" levels across the five domains of creative problem-solving. Post-assessment results revealed significant improvement, with many students reaching the "Proficient" and "Excellent" levels. Therefore, there is a significant difference in the creative problem-solving performance of Grade 7 learners before and after the implementation of the Search, Solve, Create and Share (SSCS) Model. In conclusion, teachers may consider using SSCS-based Lesson Exemplars as an effective instructional approach to foster creative problem-solving and enhance student engagement in science. School administrators may also consider integrating SSCS into teacher training and curriculum implementation, particularly under the MATATAG Curriculum, to enhance instructional practices and improve learning outcomes.

Keywords: creative problem-solving, SSCS model, science education, Grade 7 learners, MATATAG Curriculum

Chapter 1

THE PROBLEM AND ITS BACKGROUND

Introduction

Education is a dynamic process that enables individuals to acquire the knowledge, skills, and values necessary for personal growth and societal advancement. Its main goal is to prepare students for future societal roles by promoting critical thinking, problem-solving, and effective communication. Within the broader educational framework, science education is crucial for helping students comprehend the components that comprise the natural world. Encouraging students to seek evidence-based ideas and ask insightful questions rather than merely memorizing facts or formulas cultivates curiosity. This method provides students with the resources they need to critically evaluate circumstances, collaborate effectively with others, and apply scientific knowledge to develop practical solutions to real-world problems.

The objectives of science education have evolved to satisfy society's needs and reflect the increasing value of scientific knowledge. Scientific education nowadays emphasizes the acquisition of problem-solving skills necessary for managing complex, practical challenges. Modern educational approaches are notably fitting this shift in STEM (science, technology, engineering, and mathematics), which enables immersive, transdisciplinary learning. Developing students' skills for critical thinking, logical reasoning, and efficient problem-solving is the major objective (Chinn, 2023). This transformation in science education recognizes that the fundamental purpose of problem-solving is not merely result. Learners must thus combine several skills, including conceptual understanding, the application of scientific approaches, and the inclusion of metacognitive capacities (Siregar & Djulia, 2021).

In the Philippines, science education remains a challenge, particularly in preparing students to face the challenges they encounter as they transition from elementary to high school. Developing critical thinking and problem-solving skills is often impeded by learners' failure to employ academic concepts in real-world situations. Conventional teaching methods, such as lectures and memorization, limit opportunities for active learning and exploration (Verawati et al., 2023). Furthermore, insufficient resources and inadequate teacher training hinder efforts to incorporate problem-solving approaches into the curriculum successfully. Conventional methods of instruction sometimes fail to account for individual learning styles and speeds, making it challenging for students to absorb concepts and apply their knowledge (Mendoza-Muñoz et al., 2022; Farozin et al., 2022).

Despite all of this, science education is crucial for the development of scientific literacy, innovative problem-solving, and student readiness to confront the complexities of modern society. Only through addressing these challenges with innovative instructional approaches, improved accessibility, and ongoing professional development for teachers can science education have the transformative power it needs to be realized. This helps us equip the next generations to be critical thinkers, problem solvers, and contributors to a global community driven even more by science.

Background of the study

Malinao Ilaya Integrated National High School, like many other schools in the CALABARZON, is committed to improving science education with a focus on nurturing learners' critical thinking and problem-solving abilities, especially in Grade 7, where the transition from elementary to secondary education poses challenges for both teachers and students alike. Many Grade 7 learners still found it difficult to apply knowledge to real-world scenarios despite teachers' efforts to explore teaching approaches and techniques that address these challenges, emphasizing the need for teaching methods that support creative problem-solving and critical thinking skills. In education nowadays, a difficulty reflects a current problem. Conventional teaching methods focused on memorization; however, passive learning is now viewed as inadequate in preparing learners to address contemporary societal issues properly.

The Department of Education has introduced the MATATAG Curriculum, which will be implemented in Kindergarten, Grades 1, 4, and 7, aiming to raise educational standards by guiding students along several paths. This curriculum is designed to address the continuing challenges that the education sector is facing, especially in meeting competency demands. Promoting creative problem-solving among learners is one of the key goals of the Matatag Curriculum, which is achieved through innovative approaches such as project-based learning and collaborative activities. These approaches help students identify challenges, brainstorm ideas, and apply them, encouraging critical and creative thinking (Olipas, 2024). However, despite the advantages and enhancement of implementing the new curriculum, Malinao Ilaya Integrated National High School continues to face challenges in fulfilling its objectives.

The Search, Solve, Create, and Share (SSCS) model presents a potential approach to address these challenges. Edward Pizzini originally made this model. The SSCS model enables learners to become more involved in developing their creative problem-solving skills through a structured approach. Learners search for information that sparks their curiosity, solve the discovered problems, create solutions using models and diagrams, and share the results of their work with other learners for further feedback and discussion. (Ihsan, 2023; Putri et al., 2022). Also, if learners are more involved in their own learning process, they can retain more knowledge and engage deeply with the process.

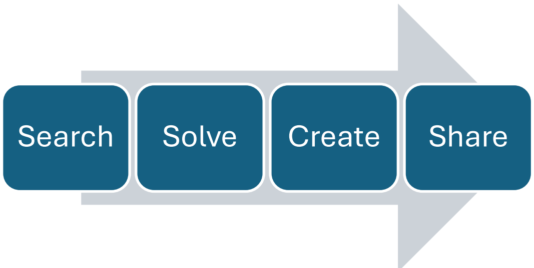
However, despite the large number of studies proving the effectiveness of the SSCS model in educational settings around the world, its use in local contexts, such as the Philippines, specifically in the Division of Quezon Province, still remains limited. In this case, this study will utilize the SSCS model to evaluate and foster creative problem-solving among Grade 7 learners at Malinao Ilaya Integrated National High School. The study's findings will potentially have a significant impact on improving local science education, supporting ongoing initiatives to strengthen the MATATAG Curriculum.

Conceptual Framework

Utilizing an inquiry-based approach, a learner-centered approach, and a structured learning process, the Search, Solve, Create, and Share (SSCS) was created to encourage students' creative problem-solving abilities. Edward Pizzini developed the model in 1988, and since then, it has been widely used, especially in the fields of science and mathematics, where it is often connected to active learning and deep engagement. The four interconnected Search, Solve, Create, and Share (SSCS) processes are essential for developing students' capacity for independent thought and creative problem-solving.

Figure 1

SSCS Model



(Oktaviani, I., & Jailani, J., 2020)

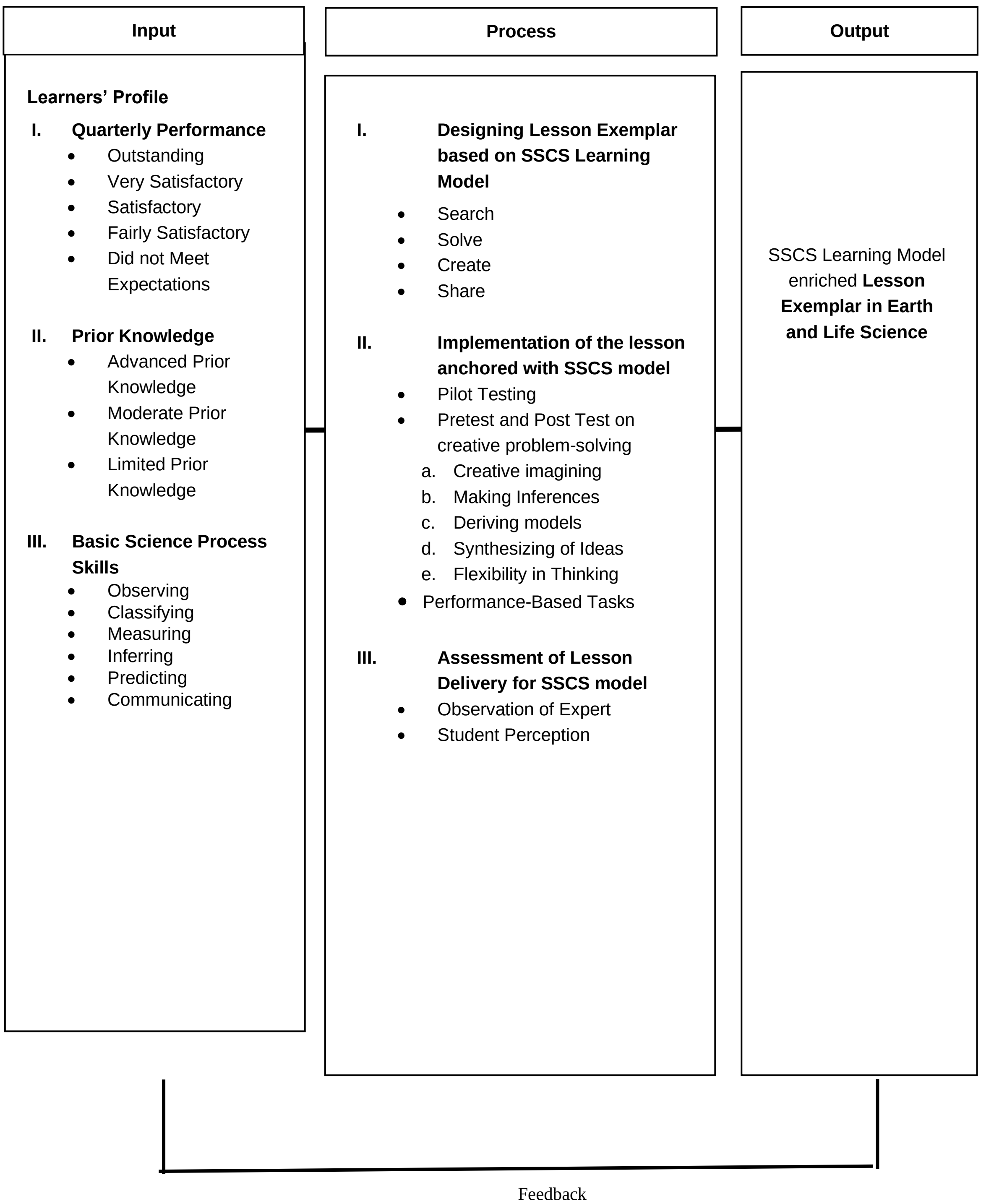
During the searching stage, students are encouraged to brainstorm and identify research questions or problems related to the given science issues. In the solving stage, students are led to produce and implement specific plans concerning the solutions they propose. Furthermore, in the creation stage, students are encouraged to develop a product, in the form of a solution, to the given problem based on the allegations chosen in the solution stage. At the end of the sharing session, students are provided an opportunity to communicate and deliver their ideas to the teacher and peers in their own groups and other groups, sharing the findings and solutions to the problems they have encountered [26]. This SSCS model has the advantage of being able to provide opportunities for the students to practice and hone problem-solving abilities (Pizzini EL, Abell SK, and Shepardson DS, 1988)

Studies by Yasin et al. (2020) and Maharani and Yuliati (2022) demonstrate the model's ability to integrate ideas, foster higher-order thinking, and provide frameworks for efficient problem-solving. SSCS aligns well with the phases of creative thinking, which include problem identification, idea generation, creative solution development, collaboration, and refining results.

As learners in Grade 7 begin to develop their capacity for thinking outside the box, the Search, Solve, Create, and Share model offers a flexible approach that enhances their ability for creative problem-solving. This method creates engaging, student-centered experiences by moving away from traditional, instructor-centered education. It enables students to conduct independent research, exercise critical thinking, and collaborate effectively in groups. Participating fully at each stage gives pupils more self-assurance when facing challenging situations in the classroom and in daily life.

Figure 2

Research Paradigm



Statement of the Problem

The purpose of this study was to find out the effectiveness of the Search, Solve, Create, and Share (SSCS) model in fostering creative problem-solving in Grade 7 learners.

It specifically aimed to respond to the following questions:

1. What is the profile of the learners in terms of their:

1.1 quarterly performance;

1.2 prior knowledge; and

1.3 proficiency in basic science process skills?

2. What is the pre and post-intervention creative problem-solving performance of the students as to:

2.1 creative imagining;

2.2 making inferences;

2.3 deriving models;

2.4 synthesizing of ideas; and

2.5 flexibility in thinking?

3. How does the delivery of the lesson for the Search, Solve, Create and Share (SSCS) Model assessed as to:

3.1 observation of expert; and

3.2 student perception?

4. Is there a significant difference in the creative problem-solving performance of Grade 7 learners before and after the implementation of the Search, Solve, Create and Share (SSCS) Model?

Research Hypothesis

There is no significant difference in the creative problem-solving of Grade 7 learners before and after the implementation of the Search, Solve, Create and Share (SSCS) model.

Significance of the Study

The researcher hoped that the findings of the study would be beneficial for the following:

To the learners. This may potentially benefit learners in terms of developing their creative problem-solving abilities, which are useful in acquiring knowledge for daily problem-solving and understanding various phenomena both inside and outside the school setting, as well as further appreciating the application of science in daily life. This may also help them become more aware of their metacognition and themselves, which will enable them to develop coping mechanisms for managing stress, tension, and other external factors in their learning process. From this, learners may acquire critical thinking skills, responsible decision-making, and problem-solving abilities, all of which are critical factors in achieving academic success.

To the teachers. This study may benefit teachers by offering insights and knowledge to assist them in making informed decisions about improving teaching-learning approaches, instructions, strategies, and activities to better align with the changing needs of students' skills, attitudes, and abilities. This study may also help teachers better understand their learners' creative problem-solving levels and develop strategies that target their learning to promote student achievement and engagement, specifically in science education. In addition, with the use of the SSCS Model, teachers can design lessons that emphasize inquiry and practical exercises, thereby increasing the relevance and effectiveness of the learning experience. Furthermore, this study may be beneficial for teachers to develop real-life problem-solving assessments to produce scientifically literate students in the long run.

To the school heads. This study may provide them with valuable information to design school policies, practices, and activities that aim to improve science education while promoting the well-being of learners through strategies to enhance creative problem-solving to achieve student success. This may also help them make decisions and allocate resources for teachers' training and technical assistance, enabling teachers to manage their own metacognition and achieve their personal and collective school goals.

To the stakeholders. From this study, stakeholders may gain insights into actively participating in shaping learners' well-being. They may also encourage participation and develop community-based Science-related activities to promote the deeper application of science, technology, and the environment for lifelong learning. They may also strengthen child support and contribute to establishing better learning environments through family-school-community partnerships, promoting positive social-emotional learning.

Scope and Limitations of the Study

This study focused on investigating the effectiveness of the Search, Solve, Create, and Share (SSCS) Learning model in fostering creative problem-solving of Grade 7 learners at Malinao Ilaya Integrated National High School in Atimonan, Quezon. Three sections of Grade 7 learners were utilized in this study. According to the DepEd Matatag curriculum guide, the Fourth Quarter of the Grade 7 science curriculum was covered in the study. Standardized assessments and evaluation rubrics based on the DepEd's criteria were used to evaluate students' creative problem-solving skills.

The study had several limitations. Initially, it examined only the short-term effects within a single academic quarter and overlooked the investigation of the long-term implications of the SSCS model. The research concentrated explicitly on creative problem-solving, excluding other significant elements of scientific literacy, such as knowledge retention. Furthermore, as the study only applied to Grade 7 learners, the results may not apply to other grade levels or broader educational contexts without further investigation. The findings were limited to the students, instruction, and approaches used in this setting.

Definition of Terms

The following terms are defined to provide a clearer understanding of the study's variable.

Basic Science Process Skills are the fundamental skills learners use when conducting scientific research. These include activities such as observing, classifying, counting, drawing inferences, making predictions, communicating with others, and asking questions. These skills are essential for learners to think scientifically and critically, and they are assessed through a diagnostic test with open-ended questions. When learners master these skills, they are better able to think critically about what they read, draw conclusions based on evidence, and apply what they've learned in the real world, especially in the SSCS learning model used in this study.

Creative imagining gives learners the chance to create new ideas or concepts given to them especially during discussions. In this study, the emphasis on the Search and Create phases highlights this domain. Additionally, the creative imagination assessment was given before and after the SSCS model employment. This will allow students to think beyond typical solutions, creating an approach that enhances their creative problem-solving as well as scientific inquiry.

Creative problem-solving skills include students' ability to handle problems especially in science subjects using logical reasoning to create real life solutions. These problem-solving skills include 5 domains: creative imaging, making inferences, deriving models, synthesizing ideas, and flexibility in thinking. In this study, this is measured through a pre- and post-test, which is composed of 20 questions: 15 multiple-choice type questions and 5 open-ended type questions, measured using a rubric.

Deriving Models enables learners to make authentic products based on their observed data and understanding. This ability is emphasized in the SSCS model's Create phase, where learners integrate what they have discovered to create models, diagrams, or flowcharts. Students are given activities that require them to clearly demonstrate their knowledge of complex scientific facts in order to assess their proficiency in this competence.

Flexibility in Thinking is the ability of learners to adapt to different perspectives that are new to them. Because the SSCS model is continuous, this thinking skill is particularly important, especially when reviewing and revising ideas. It is evaluated by examining the various and flexible methods that learners employed before and after the SSCS-driven lessons. This illustrates the importance of cognitive versatility in learning science.

Inquiry-Based Learning is a way of teaching that gets learners to think about science questions by investigating them and making decisions based on proof. This approach is built into every aspect of the SSCS model. It encourages learners to build their own knowledge by asking questions, seeking answers, and testing theories. Putting learners at the core of the learning process makes them more interested and improves their science knowledge.

Making Inferences happens when learners use what they've seen, heard, or done to come to reasonable conclusions. In this study, this skill was assessed by asking learners to infer basic science concepts from the data they found in the Search and Solve parts of the SSCS model. This is a crucial aspect of scientific thinking, and learners are assessed on their ability to complete projects that require them to analyze and interpret meaning from scientific data.

The **MATATAG Curriculum** is the reformed K to 10 educational framework introduced by the Philippine Department of Education. It aims to address the problems caused by excessive material in the old K–12 system by focusing on overall development and streamlining skills. For the 2024–2025 school year, the program will be used in Kindergarten, Grades 1, 4, and 7. This study aligns with its focus on creative problem-solving and learner-centered learning, particularly in science classes.

Prior Knowledge refers to how much learners already knew about important ideas in Earth and Life Science before the intervention. To determine how ready learners are to use the SSCS model, a diagnostic test is used. This body of knowledge affects how learners learn by affecting how they connect new information to what they already know.

Quarterly Performance is a measure of how well learners did academically based on their science grades for the quarter. For this study, the grades for the 3rd quarter of the Science subject were specifically used. The DepEd's official grading system tracks these marks, which comprise 40% of written works, 40% of performance tasks, and 20% of quarterly examinations, totaling 100% as the basis for grading learners. These are used to assess learners' overall academic standing and are part of the learner profile that this study examines.

Search, Solve, Create, and Share (SSCS) Model is a teaching model that are meant to foster creative problem solving among learners, specifically for this the study, the Grade 7 learners. The model, which comes originally from Edward Pizzini's work, which he developed in 1988, allowed for a structured approach (1) Search for relevant information to start learners' curiosity; (2) solve problems based on observed data; (3) Create with innovative products or solutions; and (4) Share results for peer discussion and feedbacking to others. The SSCS model is employed in this study through lesson examples in science, particularly in Earth and Life Science. Its success is measured by tests given before and after the intervention.

Synthesizing of Ideas involves allowing learners to combine and integrate many concepts to produce a tangible solution. This ability is particularly evident in the Create and Share phases of the SSCS model, when students combine their prior knowledge to generate fresh concepts or insights.

Chapter 2
REVIEW OF RELATED LITERATURE

In this chapter, the researcher presents a review of the literature related to the topics of the Search, Solve, Create, and Share Model and Creative Problem Solving.

Search, Solve, Create and Share (SSCS) Model

A framework for education called the Search, Solve, Create, and Share (SSCS) model seeks to enhance students' learning through activities that involve problem-solving. Finding information, addressing difficulties, devising solutions, and sharing these ideas with peers for feedback and further refinement are the four key steps in this strategy. Constructivism is an educational philosophy that emphasizes the value of students learning through group discussions and activities (Putri et al., 2022). Piaget and Vygotsky initially postulated it.

Edward Pizzini was the first to develop the Search, Solve, Create, and Share (SSCS) paradigm in 1988. The primary goal of Pizzini's work was to develop an organized approach for addressing problems in classroom settings, particularly in the teaching of science and arithmetic. Through active learning processes, his approach was designed to enhance student involvement and facilitate a deeper understanding of scientific topics (Ihsan, 2023; Yasin et al., 2020). He claims that science may be taught using the SSCS model. According to Pizzini et al. (1989), it teaches learners science concepts and how to solve scientific problems in an enjoyable and practical manner, allowing them to apply their learning, especially in real-world scenarios.

Learning that presents various abilities applies the SSCS (Search, Solve, Create, and Share) model. The SSCS model requires students to expand their conceptual knowledge by solving problems, applying it to everyday life, and improving their critical thinking skills. The SSCS learning model has four stages. At the beginning of the learning process, students are presented with problems related to the topic of the lesson. Then, students look for related solutions (search) to identify problems. Finally, students hypothesize and plan ways to solve the problem (Solve).

Furthermore, based on the information and plans provided, students can perform problem-solving tasks (Create). After that, problem-solving results are distributed and conveyed to friends and teachers (Share). Therefore, the application of SSCS learning can be modeled involving students at each stage. So that students can be more engaged and enthusiastic when learning, as they are directly involved in their education.

Although Pizzini is credited with initially creating the SSCS model, it is essential to acknowledge that, over time, other academics and educators have refined and modified the model. Building on Pizzini's pioneering work, other research has examined the model's efficacy across a range of topic areas and educational contexts. For example, scholars have examined how the SSCS model affects students' scientific literacy, critical thinking, and problem-solving skills (Purnama et al., 2020; Handayani et al., 2021). Additionally, the concept has been incorporated into several educational programs and frameworks, including Education for Sustainable Development (ESD), which emphasizes the importance of equipping students with the tools necessary to address complex global issues (Jaohari et al., 2021). This development demonstrates how educators collaborated to refine and enhance the SSCS model to meet contemporary learning needs.

Research has demonstrated that the SSCS model significantly contributes to the successful development of students' critical thinking and problem-solving skills. When compared to other students in educational environments, Yasin et al. (2020) found that students who engaged in the SSCS model demonstrated stronger performance in these areas. This improvement is connected to the aspects of the approach that encourage student involvement and engagement in their education. According to Janah (2023), the approach was commended for its capacity to improve problem-solving abilities by promoting the logical thinking required to tackle complex issues. Being a creative problem solver for learners encourages them to take part in the learning process, allowing them to participate and present their ideas in class for further feedback from their classmates.

The SSCS strategy also improves students' comprehension of science subjects. Researchers in Indonesia found that applying the SSCS approach significantly improved the critical thinking skills of high school biology students. They found that using this model encouraged learners to address problems creatively and adaptable. This study has provided strong evidence that the SSCS model is effective in other fields of Science.

According to Ihsan (2023), this model enhances learning by allowing students to explore the material while developing their problem-solving skills. According to Munawaroh's (2022) research, the SSCS model offers a novel approach for students to comprehend science topics and apply them in real-world scenarios. Additionally, Ulya (2023) notes that while the SSCS model has advantages, such as improving students' critical thinking and problem-solving skills, it also highlights the importance of selecting the appropriate level of difficulty for the presented problems and the critical role that teacher proficiency plays in successfully implementing this model. This model would only be effective if the teacher provided proper guidance. Throughout the implementation of the SSCS model, alongside the improvement of learners, teachers need to provide timely feedback to allow students to improve in the best way possible.

There is a significant relationship between science process skills and the Search, Solve, Create, Share (SSCS) educational model. By allowing learners to undergo the process, it enables them to improve their critical thinking abilities and analytical skills. According to the model described by Ihsan et al. (2023), learners first seek ideas and relevant information before applying what they have learned to solve problems. This is indeed true, as before any solutions are made, all the data that has been observed should be considered and it should be relevant, so learners will be able to apply those solutions to real-life scenarios if needed. One good example of this is the lesson about Earthquake evacuation. If their houses are located in active fault areas, they will know what to do in case of calamities. They would be able to apply all their learning to this.

As part of the process, they then develop concepts or solutions before presenting their findings to their peers. This iterative approach reflects the BSPS principles by encouraging students to apply their analytical skills in scenarios highlighted in earlier research (Handayani et al., 2021).

Accordingly, global studies also support the effectiveness and flexibility of the SSCS model. The viability of this model was examined by Kim and Choi (2021) in high schools, with a specific emphasis on its implementation in biology lessons. Their study revealed that students engaging in SSCS-centered learning tasks achieved high scores on tests measuring creative problem-solving skills and concept grasping compared with their peers in traditional lecture-based settings. The writers credit this achievement to the model's capacity to actively involve students in the learning experience by turning them into participants rather than mere receivers of knowledge.

Moreover, in 2020, Garcia et al. delved into how the SSCS model contributes to enhancing literacy and problem-solving abilities in a classroom with cultural representation. Their research findings indicated an enhancement in the capacity of students from diverse backgrounds to apply scientific principles to address real-life challenges. This holds significance within the landscape of the Philippines, characterized by a student populace hailing from diverse socioeconomic and cultural contexts. The all-encompassing vibe of SSCS ensures that all students have a chance to participate in problem-solving tasks, which is why it's gaining traction in a range of educational environments.

The utilization of the SSCS model has proven effective in enhancing student involvement and academic achievements in fields of study. Nasir and Hayya (2023) in their research findings on the SSCS model's influence on student learning activities, have sparked interest in exploring its effectiveness. Accordingly, Syafri et al. (2020) suggest that the SSCS model actively engages students in developing their math problem-solving skills and underscores the notion that true learning takes place when students independently recognize and resolve challenges.

Furthermore, incorporating technology into the SSCS model can improve its efficiency. Accordingly, a study conducted by Saddhono (2021) illustrated that merging the SSC model with tools, such as Schoology, results in an educational setting that actively involves students. This partnership does not aid in the learning journey. Also nurtures imagination and analytical thinking abilities.

According to Ariosa et al. (2021), the SSCS framework is effective for a wide range of science topics and greatly facilitates students' comprehension of concepts and scientific thinking. For instance, studies on materials for acid-base titration revealed that students who received instruction using the SSCS model performed better than those who received instruction using more conventional techniques in learning and applying the material. This demonstrates the model's significance for critical science literacy instruction (Saregar et al., 2018).

According to current science education standards, such as the Next Generation Science Standards (NGSS), scientific methods should be taught in conjunction with topic knowledge. The standards technique also meets the SSCS technique (Saregar et al., 2018). The SSCS paradigm, which blends problem-solving and creative science applications, prepares students for the demands of a rapidly evolving science environment (Munawaroh, 2022; Arisa et al., 2021). To develop the cooperation abilities that scientists and engineers will require in the future, it also assists students in creating a community of practice (Almutairi, 2022).

Students must learn more about scientific topics through systematic investigation when the SSCS approach is used in science lessons. Diani et al. (2019) demonstrated that the SSCS model had a significant impact on students' understanding of scientific concepts related to pharmacological pressure. A few students did better than those in the control groups. This illustrates how the SSCS technique enhances students' interest in the subject while also improving their understanding of science and intellectual development. Since the most recent educational changes, there has been a greater emphasis on enhancing students' understanding of environmental concerns. To help middle school pupils learn more about sustainability and the environment, Suryawati et al. (2023) explored how the SSCS approach can incorporate sustainability and problem-solving skills. The SSCS method facilitates teachers in integrating education for sustainable development (ESD) into science classes. As a result, students have a greater understanding of how people and the environment interact.

Students' social skills are also enhanced by the SSCS plan's emphasis on teamwork. Students learn how to navigate social situations and enhance their communication and teamwork skills through conversations and problem-solving exercises. The findings of Lee et al. (2023) support this. They discussed the value of using joint clinical reasoning and how classroom teamwork is comparable to business teamwork, training students to collaborate on projects in the future.

The SSCS model provides science teachers with a systematic yet adaptable approach to teaching that works for diverse classrooms and student needs. Numerous studies have shown that this approach engages and motivates pupils (Munawaroh, 2022; Suryawati et al., 2023). To motivate students to take charge of their education and engage in the learning process, the SSCS framework places a strong emphasis on the value of inquiry and teamwork.

Although there is limited research on the SSCS model in the Philippines, interest in innovative methods of instruction for scientific education is increasing. A case study examining the opinions of senior high school students in Pampanga on STEM education was conducted by Rogayan and Macanas (2020). They discovered that students favored experiential, inquiry-based learning methods, which aligns with the SSCS model's tenets. The usefulness of problem-based learning in raising the scientific literacy of Bulacan Grade 10 pupils was investigated by Mangali et al. in 2021. Their study demonstrated the advantages of student-centered, problem-solving techniques in scientific education, which are essential elements of the Student-Centered Science Curriculum and Study (SSCS) paradigm, even though they did not explicitly use the SSCS framework. A modified inquiry-based learning strategy, akin to SSCS, was employed in a recent action research study by Delos Reyes (2022) at a Cavite public high school. The study reported improvements in students' engagement and conceptual understanding of Earth Science, suggesting the potential benefits of such approaches. Studies on the SSCS model in Quezon province are scarce. There have been relevant investigations into innovative science teaching methods in our region.

At Malinao Ilaya Integrated National High School, teachers were constantly observing the work of their peers at nearby schools. For example, Villanueva (2023) from Lopez National Comprehensive High School in Lopez, Quezon, studied how project-based learning affected the environmental understanding of 9th graders. The study yielded positive results, particularly in terms of student's ability to apply scientific methods to address local environmental issues. Although these local studies don't directly examine the SSCS model, they demonstrate how innovative, situation-specific teaching methods can be beneficial in this area. Implementing the SSCS plan at Malinao Ilaya Integrated National High School may be effective because it emphasizes problem-solving and real-life applications.

To summarize, Pizzini's SSCS model builds upon current teaching methods and aims to help students develop better creative problem-solving skills. It achieves this by encouraging students to explore, collaborate, and apply what they have learned. The SSCS model could help our learners improve their problem-solving skills.

Creative Problem Solving

To address difficulties in various fields, creative problem-solving (CPS) combines critical thinking with imagination. The importance of CPS is becoming increasingly apparent to people in personal, professional, and educational contexts. This demonstrates how it might foster more creativity and adaptability in a rapidly changing world.

Creative Problem-Solving as a Process

Creative problem-solving is frequently described as a systematic approach that can help identify effective solutions to challenging issues. According to Puccio, CPS comprises several processes that help individuals identify issues, consider thoughtful solutions, and experiment (Puccio, 1999). The processes often involve identifying the issue, generating concepts, developing a solution, and assessing its effectiveness (Alabbasi & Cramond, 2018).

Wallas' model divides CPS into four main steps: preparation, incubation, activation, and evaluation (Mardianti et al., 2018). Each step is crucial for generating creative ideas. In the planning stage, you gather information and define the problem. In the incubation phase, your unconscious mind can work on your thoughts (Mardianti et al., 2018). When a solution suddenly becomes clear, this is referred to as illumination. Verification is the process of evaluating and improving the offered solution. You can bring new ideas to the way we teach by changing these steps to help students think creatively and work together as a team (Buijs et al., 2009).

McFadzean also discussed the importance of facilitators in the CPS process, noting that skilled facilitators can effectively lead teams through these steps, which ultimately improves results (McFadzean, 1998). This organized method ensures that the issue is examined from various angles, leading to more comprehensive answers and a better understanding among all parties.

Creative Problem Solving as an Ability

Creative problem-solving is both a process and a skill that anyone can learn. It uses a lot of different mental abilities. Lin states that powerful CPS skills can impact creativity in various fields; individuals with strong CPS skills are more likely to generate and apply new ideas more efficiently (Lin, 2017). It is also possible to enhance CPS skills through targeted educational programs that aim to improve traits such as fluency, flexibility, creativity, and elaboration (Amran et al., 2019).

Creative problem-solving is a process, method, or system to approach problems imaginatively and produce effective actions. Creative Problem-Solving (CPS) is the ability to emphasize various alternative ideas and to look for various possible actions at each step of the problem-solving process. Creative problem-solving abilities contain some aspects that can facilitate the achievement of problem-solving goals. Some aspects of creative problem-solving abilities consist of six indicators, as follows: 1) Objective finding, identifying situations that present challenges, opportunities, or problems related to something you want to do; and 2) Fact-finding, recording all key facts related to the desired situation or goal. The aim is to gather all relevant knowledge about the situation so that key issues can be identified and addressed. 3) Problem finding, identifying the collected data related to the situation in the form of facts, then determining what issues are to be achieved in more specific terms, turning the problems into resolvable forms or cases. 4) Idea finding: trying to answer a statement about the subject matter with a variety of different solutions or ideas. 5) Solution finding, choosing the best solution after evaluating a list of ideas that follow the standard or certain criteria or parameters. 6) Acceptance finding, developing action plans from the best ideas or solutions and considering plans that support the answers (Mitchell WE and Kowalik TF, 2019). Some aspects of creative problem-solving in Science learning are used to find the best and optimum solutions. The creative aspects of creative problem-solving focus on facing new challenges as opportunities to deal with unknown or ambiguous situations and managing productive tensions caused by the gap between goals and reality. To develop students' creative problem-solving abilities, educators play a role in regulating learning activities. So that educators can develop learning designs using appropriate models, strategies, and media that enable and accommodate students' creative problem-solving abilities. The ideal science learning process involves using an experimental method, allowing students to form a pattern of interactions and materials through direct experience. For this reason, a learning model that utilizes experimental methods is needed to help students understand.

According to research by Reiter-Palmon and Illies, leaders who approach problem-solving through a creative lens can significantly enhance team relations and performance. This indicates that CPS is a valuable skill to possess in the workplace (Reiter-Palmon & Illies, 2004). Furthermore, Almeshal and Aloud noted that individuals with higher levels of CPS are more adept at solving complex problems. They suggested that promoting these skills should be the main goal of school programs (Almeshal & Aloud, 2019).

Cho developed the Dynamic System Model of Creative Problem-Solving Ability, which illustrates how various factors that influence CPS interact. This model demonstrates that thinking skills, emotional intelligence, and social skills are crucial for generating innovative and creative ideas (Lin & Cho, 2011). As a result, teaching these skills to students can enhance their ability to solve problems in various situations in the future. Creative problem-solving relies on several essential skills, including the ability to envision solutions, draw logical conclusions, construct models, integrate ideas, and think outside the box. Coming up with new ideas and picturing possible answers to problems are part of creative thinking. During the planning phase of CPS, it is crucial. According to Isen et al., positive affect facilitates the creative problem-solving process by broadening people's thinking and enhancing their ability to generate new ideas. Students are better able to think outside the box and find answers that don't follow the norm when they do creative activities.

Making assumptions means being able to conclude the knowledge you have access to. This helps with problem-solving by enabling you to apply both logic and intuition. In their 2018 paper, Mardianti et al. emphasized the importance of concluding mathematical models, stating that students who excel in this area are more likely to apply their classroom knowledge in real-life situations. This cognitive skill is essential for assembling pieces of knowledge and determining the most effective ways to solve complex tasks.

Making imaginary versions of real-life situations is what deriving models is all about. They help people understand complicated ideas and make smart choices. Ridgway stated that modeling is important for both scientific research and CPS because it helps students understand how things work and what the results are (Buijs et al., 2009). Modeling that works well helps people understand basic concepts more effectively, which can be very helpful for tackling complex problems in various fields.

Combining different ideas into a single coherent whole is called the synthesis of ideas. This is a crucial step in developing new solutions. Oh pointed out that combining different ideas can lead to creative problem-solving breakthroughs, making possible answers better than usual (Oh, 2017). This feature highlights the importance of using interdisciplinary methods in education, where combining different areas of knowledge can lead to more effective ideas and solutions.

Thinking flexibly means being able to adjust your approach based on new information or to view a problem from different perspectives. This skill is crucial for addressing problems that constantly evolve, and it has been linked to more creative work. The authors of Daher and Anabousy (2020) emphasized the importance of cognitive flexibility, highlighting how it enables future teachers to consider various approaches to problem-solving.

Creative Problem Solving in Science Education

When students are in science class, they often have to solve challenging questions that require creative thinking and insightful answers. Learning how to do CPS is a valuable skill to possess. By employing an active teaching method, CPS encourages students to think critically and explore innovative solutions to scientific questions. People named Ihsan et al. (2023) suggest that including CPS in the science program makes things easier to understand, sparks their imagination, and encourages them to pursue further scientific study.

CPS provides students with the tools they need to think critically about how to solve complex scientific questions, which helps them learn how to conduct scientific studies. Davis et al. (Handayani et al., 2021) suggest that students who learn CPS are better at planning their studies, generating ideas, and analyzing data.

CPS also helps students work together in science classes, enabling them to learn more. They learn about alternative approaches and diverse perspectives when they collaborate to achieve their goals. The opportunity to discuss and reflect in this group work setting helps students reevaluate their ideas and improve their problem-solving skills (Diani et al., 2019). When you use CPS to get people to work together, Pappas (Suryawati et al., 2023) says that the science talks and results are better.

To learn science, you need to be able to think critically, and CPS helps students get much better at that. McKeller et al. and Lee et al. (2023) found that when students participate in CPS events, they often exhibit better reasoning skills. In other words, they can take facts and thoughts more seriously. To think scientifically, students must be able to examine facts, consider different perspectives, and draw reasonable conclusions. The CPS also tells students that they should be prepared to adjust their thinking when trials present challenges or unexpected results. Baird et al. and Putri et al. (2022) say that students who learned CPS methods were more willing to change their ideas when they learned something new, which is an important part of scientific study. It's essential to be able to adapt when teaching science, as tests often yield unexpected results that require reevaluation and adjustments to the methodology.

CPS is an important part of STEM (Science, Technology, Engineering, and Math) education because it prepares students for jobs in highly technical and emerging fields. The focus of STEM education is on applying skills and knowledge to solve real-world problems, and CPS serves as a bridge between classroom learning and its practical application (Arisa et al., 2021). According to Rosen et al. (Ali et al., 2021), incorporating CPS into STEM classes enables students to think creatively about solving challenging engineering design problems by integrating information from various fields.

Since it enables students to devise original solutions to problems, creative problem-solving is essential in many educational contexts. For instance, research indicates that students' problem-solving and creative thinking skills improve significantly when CPS is incorporated into learning models such as the SSCS (Search, Solve, Create, and Share) model (Syafri et al., 2020; Putri et al., 2022). By first seeking information, then addressing the problem and devising solutions, and finally sharing what they have learned with their classmates, students are encouraged to participate in problem-solving within the SSCS paradigm (Putri et al., 2022).

Students' creative problem-solving (CPS) abilities are enhanced by the Search, Solve, Create, and Share (SSCS) model, which provides a structured framework that encourages participation and teamwork. Students are asked to examine various sources and gather information during the "Search" portion. This aids in their inferences and improves their understanding of the issue (Oh, 2017). This level fosters their creative thinking and prepares them to generate new concepts. Students apply what they have learned to create models and solutions that demonstrate their understanding during the "Solve" phase. Because they may modify their approaches in response to what they learn, this allows kids to think more freely (Ardiyani et al., 2018). During the "Create" phase, students can collaborate with their friends and pool their ideas. This fosters an environment in which diverse viewpoints can lead to novel solutions (Ulandari et al., 2019).

Last but not least, the "Share" step encourages students to talk about their research and solutions. This enhances their communication skills and fosters greater self-confidence in their creative abilities (Weibel et al., 2017). By incorporating these components, the SSCS model enhances students' CPS abilities and equips them with the critical and creative problem-solving skills necessary to navigate complex situations in the real world (Mulyatna et al., 2021).

To develop students' creative problem-solving abilities, educators play a role in regulating learning activities. So that educators can develop learning designs using appropriate models, strategies, and media that enable and accommodate students' creative problem-solving abilities. One learning model that can be used is the Search, Solve, Create, and Share (SSCS) learning model. The SSCS learning model is one of the learning models that utilize problem-solving approaches. This SSCS model offers the advantage of providing students with opportunities to practice and hone their problem-solving abilities. Based on the results of previous studies related to the implementation of the SSCS learning model, it has been found that the SSCS learning model has a positive impact on learning activities.

Learning activities utilizing the SSCS model for problem-solving applied to the experimental class may significantly improve students' concept mastery compared to the control class. Furthermore, the SSCS model influences students' learning outcomes (Prawindaswari, PD, Suarjana, IM, and Widiana, IW, 2019) and students' creative thinking abilities. Based on previous relevant studies, there is no research focusing on the implementation of the SSCS model on students' creative problem-solving ability. Previous research on creative problem-solving ability has shown that the achievement and improvement of mathematical creative problem-solving abilities in students who learn through the Challenge-Based Learning (CBI [illegible] roach are better than those of students who learn with a traditional scientific approach.

Chapter 3
RESEARCH METHODOLOGY

This chapter presents the methodology used in this study. A description of the research design, including the respondents, population, and sampling technique, was provided. It also contains the research instruments used, the research procedure, and the statistical treatment of data, all of which are presented in this chapter.

Research Design

A developmental research design and a quantitative approach were used in this study. There were pre-tests and post-tests. The study took place over one school quarter. This time frame aligned with the school's calendar and program, making it easy for the intervention to fit into learners' daily schedules without interfering with their academic progress. Since it was scheduled during the academic quarter, there was sufficient time to implement the intervention, observe it, and evaluate its effectiveness. This allowed for a full review of how well it worked on learners and the recording of measurable gains. This study employed a method called "developmental research" to assess the effectiveness of the solution while also refining and modifying it based on the results. This helped make teaching better.

Respondents of the Study

The respondents for this study were the Grade 7 learners from Malinao Ilaya Integrated National High School. The researcher included 120 learners divided into three groups for this study.

Population and Sampling Technique

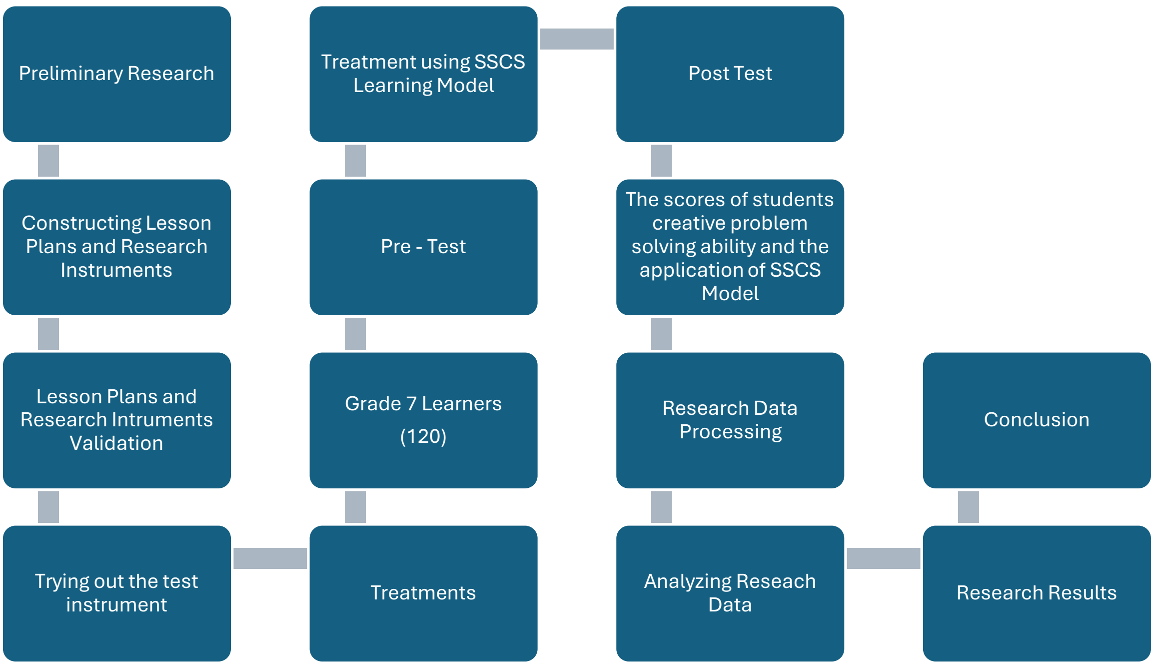
The study's target population consisted of all Grade 7 learners in public secondary schools in Atimonan, Quezon. For its accessibility and practicality, the primary focus was on Malinao Ilaya Integrated National High School, as limiting the study to this specific school was more feasible and provided useful insights potentially applicable to the wider community of Grade 7 learners in the region.

The total population was employed to ensure the study was sufficiently facilitated. One hundred twenty learners were used. This number of participants was expected to have sufficient statistical power to detect significant differences among the categories. The participants were from the existing Grade 7 classrooms, ensuring a representative diversity of academic ability, genders, and socioeconomic statuses. This approach preserved the external validity of the findings within the framework of our school and comparable rural high schools in Quezon province.

Data Gathering Procedure

Figure 3

Research Flow Chart



The research began with constructing a lesson plan anchored to the Search, Solve, Create, and Share Model and making a Research Instrument.

After this, instruments were validated and tested. Then, a pre-test was given to 120 Grade 7 learners. This test was intended to measure their early creative problem-solving abilities in science. The pre-test included multiple-choice questions covering aspects of creative problem-solving, such as creative imagining, making inferences, deriving models, synthesizing Ideas, and flexibility in thinking. As a baseline, the pre-test results in Creative Problem Solving were compared to the post-test results to determine how successful the SSCS model has improved these abilities.

Additionally, a 20-item diagnostic test was administered to assess their Prior knowledge, and 6-item, 30-point open-ended questions were used to evaluate their basic process skills, which served as a basis for profiling them, as these skills are foundational to scientific inquiry and problem-solving. Students who were adept in these skills engaged more deeply with complex tasks. The SSCS model was implemented in the Grade 7 class throughout the academic quarter. This implementation involved modifying the lesson structure to align with the SSCS model's four phases—Search, Solve, Create, and Share—emphasizing scientific concepts, specifically those related to Earth and Life Science. The Search, Solve, Create, and Share (SSCS) model was implemented in a systematic approach over a four-day cycle, with each day focused on a particular phase corresponding to essential components of creative problem-solving (CPS).

At the end of the intervention, every student took a post-test that was similar to the pre-test in terms of creative problem-solving. The results of the assessment will be compared to determine how well the students performed after implementing the SSCS model. The comparison was more accurate and revealed the true results of the SSCS model on students' capacity for creative problem-solving since the same assessment was used for both the pre-test and post-tests.

To ensure that the SSCS model is properly utilized each week of employment, the School Head and Master Teacher conduct daily observations. A numerical checklist was used to determine if all phases of the SSCS model were well executed. The strategy ensured the successful implementation of the SSCS model. This observation was essential to ensure that the model was consistently applied in the same manner, maintaining the validity of the research.

A perception poll was also conducted among the trainees as part of the research. Using Likert scales, this poll allowed students to reflect on their experience with the SSCS model. It revealed how they felt about the learning process and how it impacted their ability to devise creative solutions to problems.

Research Instruments

1. **Learners Profile:** This profile includes three parts:
    - The first part was the 3rd Quarterly performance of the learners in terms of their grades in science.
    - The second part was the diagnostic test to assess the prior knowledge of the learners. This is a researcher-designed test designed to assess the prior knowledge of Grade 7 students on Quarter 4 topics in Earth and Life Science. The test aligns with the MATATAG Curriculum lessons from Weeks 1 to 8. This part consists of a 20-item test administered to the learners.
    - The last part was a diagnostic test to assess their basic science process skills. This instrument consisted of 6 items, each with 30 points, open-ended type questions that determined proficiency in basic science process skills. Each of the instrument's six sections—observing, classifying, measuring, inferring, predicting, and communicating—concentrates on a distinct science process skill. The MATATAG curriculum's intended learning skills for Earth and environmental science are consistent with these competencies.
      a. Observing - The learners were given two pictures: one of a fault line and the other of the aftermath of an earthquake. They are required to highlight at least three differences and three similarities between the picture. This activity encourages careful attention and the ability to distinguish key visual signals connected with geological processes.
      b. Classifying - Learners were required to divide a list of five seismic-related objects into two categories based on their origin: natural and manufactured. This activity tests students' understanding of natural phenomena.

c. Measuring – Learners were asked to describe how they would use a graduated cylinder to measure 100 milliliters of seawater accurately. In addition to instructing on how to interpret the measurement using established laboratory methods correctly, they must detail each step of the process. This evaluates their attention to detail and procedural understanding.
d. Inferring – A scenario in which dirt slides down a hill owing to heavy rain is illustrated. Learners discovered the connection between soil stability and water content. This employment fosters logical reasoning and the ability to draw conclusions based on observation.

e. Predicting - If the Amihan monsoon lasts longer than planned, learners were able to forecast probable meteorological changes in Southeast Asia. This section assessed learners' ability to predict future occurrences using their knowledge of climate trends.
f. Communicating – Learners gave brief paragraphs detailing how they would experiment to discover how sunlight impacts plant development. The setup, the control parameters, and the mechanism for measuring growth must all be discussed. This examined their ability to communicate scientific topics in a logical and clear manner.

2. **Search, Solve, Create and Share Model (SSCS) based Lesson Exemplar:** This is an 8-week researcher-designed Lesson Exemplar in Earth and Life Science, aligned with the Search, Solve, Create, and Share (SSCS) model, specifically designed to foster creative problem-solving skills among Grade 7 learners. The exemplar caters to each DepEd MATATAG Curriculum learning competency, utilizing inquiry-based strategies and real-world applications to deepen students' understanding of key scientific concepts. It addresses the challenges students face in developing creative problem-solving abilities, engaging them in higher-order thinking skills (HOTS) through activities that promote critical and creative thinking, the synthesis of ideas, and reflection. This exemplar also contained open-ended questions, multiple-choice type exams, rubrics, and a performance-based task that better enhanced the creative problem-solving skills of the Grade 7 learners.

3. **Creative Problem-Solving Skills Assessment:** The instrument developed for this study was utilized in both the pre-test and post-test phases. This research instrument is a structured science-based assessment tool that evaluates Grade 7 learners' creative problem-solving abilities, especially in Earth Science. The instrument is based on the skills outlined in the MATATAG Curriculum and focuses on key topics, including earthquakes, faults, seismic waves, and disaster preparedness. It combines multiple-choice questions and open-ended questions to assess factual knowledge and learners' ability to apply scientific reasoning to real-world situations.

Twenty items make up the test. The first part (Items 1–15) consists of multiple-choice questions, where students must select the letter that best matches the answer. In this section, the questions are based on real-life science and social events, such as the Pacific Ring of Fire and past earthquakes in the Philippines. They ask students to evaluate how well different disaster risk reduction methods and models are effective. The Philippine Volcanology and Seismology (PHIVOLCS) Earthquake Intensity Scale (PEIS), fault shifts, tectonic plate interactions, and seismic wave features are some of the topics discussed. These questions assess how well students understand science concepts and how effectively they can analyze, synthesize, and evaluate information.
The second part (Items 16–20) has free-form questions to see how well students can think creatively and critically. Students must come up with new ways to make communities more resilient to disasters, study how different types of faults affect the design of infrastructure, create a model of an earthquake response system using information about the focus and epicenter, design structures that are resistant to earthquakes while taking wave behavior into account, and come up with different ways to get communities ready for disasters based on the severity of the earthquakes they might experience. The goal of these tasks is to increase students' interest in science by encouraging them to apply it in real-life scenarios.
The scoring method evaluates both the accuracy of the answer and the quality of the reasoning. For every correct answer, you get one point on a multiple-choice question. Analytical rubrics are used to grade open-ended answers. Depending on how the reasons are weighted, the

highest score that could be given is 35 points.

4. **Checklist Observation of Experts:** The SSCS Implementation Observation Checklist was a researcher-made instrument for monitoring and documenting the actual classroom implementation of the Search, Solve, Create, and Share (SSCS) Model. Experts include the School Principal as well as the Master Teacher of the School. This checklist was a structured framework that aligns with the MATATAG Curriculum and focuses on important instructional strategies and actions by learners that are suggestive of effective SSCS-based learning settings. It was created to help achieve the study's goals by providing consistent observational data on how the SSCS model is used in practice. The instrument contained specific observation items organized by both teacher's and learners' activities for each step of the SSCS model. Each item is graded on a 5-point Likert scale: 1 (not observed), 2 (rarely observed), 3 (sometimes observed), 4 (often observed), and 5 (always observed). Observers are also encouraged to provide comments for each evaluation to contextualize their observations and emphasize the qualitative aspects of the implementation.
5. **Student Perception Survey:** The survey provided to students includes 15 Likert-scale questions aimed at capturing their perspectives on the SSCS model. It measured their perceptions of the model's effectiveness, satisfaction with the process, and applicability to real-world challenges in their area. This survey helped collect information on learners' experiences and thoughts about the SSCS model and its impact on their learning.

Statistical Treatment of Data

In-depth data analysis was conducted in this study to assess the effectiveness of the SSCS model in helping Grade 7 learners solve problems creatively. Each statement of the problem led to a different set of statistical studies. In SOP 1, which focused on the learner profile, frequency and percentage were used to illustrate the learners' previous knowledge level, basic process skills proficiency, and quarterly grades.

For SOP 2, determining the mean and frequency of the pre- and post-test results for trainees' creative problem-solving skills before and after implementing the SSCS model was part of the study.

In SOP 3, which focused on teaching using the SSCS model, two methods of analysis were employed. The observation data from the principal and the master teacher were analyzed using only the mean. The results from the student perception survey were analyzed using both the mean and standard deviation to show the overall trend and the range of responses.

Using a paired samples t-test for analysis, SOP 4 aimed to determine whether learners' creative problem-solving abilities changed significantly before and after applying the SSCS model. Since a repeated measures design involves testing the same set of students twice, the statistical test used was suitable.

With a level of significance of $\alpha = 0.05$ for hypothesis testing, all statistical analyses were carried out using the appro software. This comprehensive statistical research provided a clear understanding of the learning effectiveness of the SSCS model.

Chapter 4

PRESENTATION, ANALYSIS AND INTERPRETATION OF DATA

This chapter presents the results of the statistical analyses done to determine how the Search, Solve, Create and Share (SSCS) Model fosters Creative Problem-Solving among Grade 7 learners. This section covers the results of the data collected from the pre-test and post-test, as well as learners' and experts' evaluations. This also includes the data for the learners' profile, which includes the 3rd Quarterly Grades, the result of the prior knowledge test, and the basic science process skills test.

Table 1

Learners' Profile in terms of their Quarterly Performance

Grades	**Frequency**	**Percent**	**Verbal Interpretation**
90 - 100	36	30	O
85 – 89	26	22	VS
80 - 84	23	19	S
75 - 79	35	29	FS
Below 75	0	0	DNME
Total	**120**	**100**	

Legend: 90 – 100
Outstanding (O), 85 – 89 Very Satisfactory (VS), 80 - 84 Satisfactory (S), 75 – 79 Fairly Satisfactory (FS), Below 75 Did not Meet Expectations (DNME) (DepEd Order No. 8, s. 2015)

As shown in Table 1, the learners' profiles regarding their quarterly performance indicate that a large number of learners exhibited outstanding academic achievement. Out of 120 learners, 36 or 30%, attained marks in the 90–100 range, classified as Outstanding per DepEd Order No. 8, s. 2015. This signifies that one-third of the class excelled during 3rd Quarter. However, 23 learners, representing 19%, were classified in the Satisfactory category, with grades between 80 and 84. Additionally, 35 students, or 29%, attained grades in the 75–79 range, classified as Fairly Satisfactory, indicating that these learners are nearing competency but still have areas requiring further improvement. Learners in the lower performance levels encounter struggles, especially in their written outputs, including summative assessments, which are a very important part of their overall science grade, as this accounts for 40% of the total grade. This requires learners to apply their understanding through written tests, problem-solving, and knowledge application. Similarly, performance tasks, which contribute 40% to the final grade, demand a higher level of engagement, creativity, and practical application of scientific concepts, which these students often find challenging. The remaining *20%* of the grade comes from the quarterly examination, which assesses cumulative knowledge. Given the weight of these components, struggles in both written and performance-based tasks made a huge impact on the learners' academic performance in science.

Table 2

Learners' Profile in terms of their Prior Knowledge

Points	Frequency	Percent	Verbal Interpretation
16 - 20	**16**	**13.33**	**APK**
10 - 15	**61**	**50.83**	**MPK**
0 - 9	**43**	**35.83**	**LPK**
Total	**120**	**100**	

Legend: 16 - 20 Advanced Prior Knowledge (APK), 10 – 15 Moderate Prior Knowledge (MPK), 0 - 9 Limited Prior Knowledge (LPK) (Binder et al. 2019)

Table 2 presents the profile of learners based on their prior knowledge as assessed before the start of the discussion. Of the 120 students, 16 (13.33%) had advanced prior knowledge, scoring between 16 and 20 points. These students correctly answered both fundamental and applied problems. For instance, students correctly recognized that Love waves roll perpendicular to the direction of wave propagation *(see Appendix E - Question 7)* and comprehended that tsunamis are caused by the abrupt rise of the seafloor following an earthquake in a subduction zone (Question 8). Their performance demonstrated a thorough comprehension of cause-and-effect interactions in geoscience subjects.

With scores of 10 and 15, sixty-one students (50.83%) were classified as having moderate prior knowledge. These learners typically demonstrated familiarity with simpler concepts, such as recognizing that the epicenter is the point on the Earth's surface directly above the focus (See Appendix E, Question 4) or understanding that the Pacific Ring of Fire is a region that experiences frequent earthquakes and volcanic activity (Question 1). But questions that required scientific differentiation or comparison thinking, as differentiating between earthquake magnitude and intensity (Question 5) or elucidating the Coriolis influence on global wind patterns (Question 15), would have been more difficult for them.

Finally, due to their limited prior knowledge, 43 students (35.83%) received scores ranging from 0 to 9. Even answering simple factual questions has been challenging for these students. They had trouble remembering that the troposphere is the atmospheric layer closest to the Earth's surface (Question 12) or accurately stating that the best course of action during an earthquake is to remain indoors and seek shelter behind strong furniture (Question 10). The findings suggest that these students required more fundamental assistance and supervised discussion, as they were less familiar with the concepts.

Table 3

Learners' Profile in terms of their Proficiency in Science Basic Process Skills

Scores	Frequency	Percent	Verbal Interpretation
26 - 30	11	9.17	OU
21 - 25	30	25.00	VSU
16 - 20	30	25.00	SU
11-15	25	20.83	LU
0 - 10	24	20.00	UP
Total	120	100	

Legend: 26 – 30 Outstanding understanding (OU), 21 – 25 Very Satisfactory understanding (VSU), 16 - 20 Satisfactory understanding (SU), 11 – 15 Limited understanding (LU), 0 -10 Unsatisfactory performance (UP) (Asrial, Syahrial, Luthfi, & Nugroho., 2020)

Table 3 shows the learners' profiles about their basic scientific process proficiency level. Out of the 120 students, 11 (9.17%) had scores in the 26–30 range, demonstrating outstanding understanding. These learners provided detailed answers and supported them with relevant examples. For example, during the observing question, they identified three differences and three similarities between the aftermath of an earthquake and a fault line. In the predicting question, learners discussed how the change from Habagat to Amihan affected weather patterns as well as everyday life and agricultural labor.

Thirty students (25.00%) achieved scores between 21 and 25, indicating a satisfactory level of comprehension. With only a few small mistakes, this group's answers were mostly precise and well-structured. In the communicating question, learners used certain aspects of the image to explain their observations and explain how water and sunshine influenced plant development.

With scores ranging from 11 to 15, 25 students (20.83%) had limited understanding. They weren't precise or clear in their answers. They found it difficult to distinguish between natural occurrences and artificial tools in the classification question. The link between plant development, sunlight, and water levels was not adequately explained, and certain elements of the question remained unanswered. Lastly, 24 students (20.00%), who had unsatisfactory performance received scores ranging from 0 to 10. These students frequently provided insufficient or unanswered answers. They were unable to characterize the elements of the pictures in the observing task. They provided broad remarks in the prediction question, not referring to monsoon patterns or impacts. They demonstrated little comprehension of the scientific process abilities evaluated in the test, as reflected in their responses.

Table 4

Learners' Pre and Post Intervention Creative Problem Solving Performance as to Creative Imagining

Scores	Pre-test		Post-test		Interpretation
	F	%	F	%	
6-7	6	5.00	22	18.33	Excellent
4-5	30	25.00	42	35.00	Proficient
2-3	42	35.00	39	32.50	Basic
0-1	42	35.00	17	14.17	Needs Improvement
Total	120	100	120	100	

***Legend**: 6 - 7 Excellent, 4 – 5 Proficient, 2 – 3 Basic, 0 -1 Needs Improvement (Syracuse University, 2019)*

Table 4 presents the learners' performance in creative problem-solving, specifically in creative imagining, before and after the intervention. The pre-test results showed that a majority of the learners had scored within the basic and needs improvement levels. Specifically, 42 learners (35.00%) fell under the basic category (scores 2–3), and another 42 learners (35.00%) scored within the needs improvement range (scores 0–1). These learners had often demonstrated limited application of scientific concepts and had given general or unclear responses. For instance, when asked to suggest strategies for communities near the Pacific Ring of Fire *(See Appendix G)*, several provided broad suggestions, such as relocating or building shelters. Still, their answers lacked context, scientific justification, or community-specific relevance. Their use of terminology had been inconsistent, and many responses lacked elaboration or connection to the underlying geoscience principles.

At the same time, 30 students, or 25 percent, had scored within the proficient level (4–5 points). In general, these students chose good answers and demonstrated an understanding of important concepts, such as how to utilize technology to manage geological stress or monitor fault lines. However, their answers were often unclear. In questions like the one about controlling tectonic movement, some students chose answers that made sense from a scientific point of view, such as injecting chemicals into fault lines. Still, they didn't fully explain or support these choices. On the pre-test, only six students (5%) had reached an excellent level (6–7 points). These students demonstrated that they understood, applied scientific thinking, and generated creative ideas that could be effective. For instance, they chose options like installing shock-absorbing layers and provided reasons from the perspective of how earthquake waves affect buildings in cities. They provided open-ended answers, naming community-specific strategies such as creating hazard maps, conducting regular earthquake drills in schools, and building multi-purpose escape centers.

In the post-test, observable improvements had been recorded. The number of learners who scored at the excellent level increased to 22 (18.33%), suggesting an improvement in their ability to connect scientific concepts with realistic applications. These learners provided more detailed and structured responses. They had also shown greater awareness of local conditions in designing disaster preparedness plans. The number of learners at the proficient level had increased from 30 to 42 (35.00%). Their responses remained scientifically relevant but still showed areas where explanation and creativity needed further development. For instance, they had correctly identified engineering interventions related to fault activity, although some had continued to describe these solutions in vague terms.

A slight decrease had been observed in the number of learners at the basic level, from 42 (35.00%) to 39 (32.50%). These learners had continued to show familiarity with terms and general concepts but had struggled to provide context-specific or original ideas. Their responses frequently repeated factual information without converting it into applicable strategies. The number of learners in the 'needs improvement' category decreased from 42 to 17 (40.48%), indicating that fewer learners exhibited major misunderstandings or confusion after the intervention.

Table 5

Learners' Pre and Post Intervention Creative Problem Solving Performance as to Making Inferences

Scores	Pre-test		Post-test		Interpretation
	F	%	F	%	
6-7	10	8.33	26	21.67	Excellent
4-5	34	28.33	33	27.50	Proficient
2-3	29	24.17	42	35.00	Basic
0-1	47	39.17	19	15.83	Needs Improvement
Total	120	100	120	100	

***Legend**: 6 - 7 Excellent, 4 – 5 Proficient, 2 – 3 Basic, 0 -1 Needs Improvement (Syracuse University, 2019)*

Table 5 presents the learners' creative problem-solving performance in making inferences before and after the intervention. In the pre-test, most learners were classified under the 'needs improvement' (47, 39.17%) and 'basic' (29, 24.17%) categories. These learners often identified scientific terms but struggled to apply them in context. For example, in Question 4 *(See Appendix G)*, many selected incorrect answers, such as erosion-related processes rather than tectonic movements. In Question 5, several misinterpreted the cause of mountain formation, selecting normal or erosion faults instead of reverse faults. Their responses to Question 17 were brief and lacked clear reasoning connecting fault activity with structural safety. Many used vague phrases or listed general safety tips without linking them to fault movement types.

A total of 34 learners (28.33%) achieved proficient scores. These learners were able to choose appropriate answers and showed partial understanding. In Question 6, some correctly associated strike-slip faults with horizontal ground shifts but did not explain how that affects buildings. Their responses to open-ended items mentioned flexible building materials but lacked depth in discussing fault-specific risks or structural design. Only 10 learners (8.33%) reached the excellent level. These learners provided well-reasoned responses, accurately identified geological patterns, and explained how these connected to urban planning and infrastructure. For example, they recognized that cities near reverse faults should prepare for vertical ground movement and suggested using reinforced foundations to manage stress.

After the intervention, post-test results showed improvements. Learners in the excellent category increased to 26 (21.67%), showing stronger connections between fault types and their impacts. In Question 17, these learners recommended specific building strategies and justified them using scientific reasoning. The proficient group remained steady (33 or 27.50%), but some learners provided more developed answers. The number of learners in the basic category rose to 42 (35.00%), indicating progress among previously low-performing learners who began identifying correct answers, though their reasoning remained limited. The number of learners in the 'needs improvement' group decreased to 19 (15.83%), suggesting that fewer learners demonstrated misconceptions or disconnected reasoning after the intervention.

Table 6

Learners' Pre and Post Intervention Creative Problem Solving Performance as to Deriving Models

Scores	Pre-test		Post-test		Interpretation
	F	%	F	%	
6-7	11	9.17	21	17.50	Excellent
4-5	33	27.50	42	35.00	Proficient
2-3	33	27.50	40	33.33	Basic
0-1	43	35.83	17	14.17	Needs Improvement
Total	120	100	120	100	

Legend*: 6 - 7 Excellent, 4 – 5 Proficient, 2 – 3 Basic, 0 -1 Needs Improvement (Syracuse University, 2019)*

Table 6 shows the learners' performance in creative problem-solving related to deriving models, both before and after the intervention. In the pre-test, 43 learners (35.83%) scored within the 'needs improvement' category, and another 33 learners (27.50%) fell under the 'basic' level. These learners often struggled to explain the relationship between the focus and epicenter, as seen in Question 7, where many chose options that showed a limited understanding of earthquake dynamics, such as stopping seismic energy or directing earthquakes to unpopulated areas. Their answers to Question 18 were often brief. They lacked logical structure, usually listing general responses like "build stronger houses" or "evacuate faster" without linking those actions to the location of the epicenter or the depth of the focus.

Only 11 learners (9.17%) reached an excellent level during the pre-test. These learners were able to explain how seismic energy traveled from the focus to the epicenter using accurate models, such as water ripple analogies. In Question 18, they proposed response systems that incorporated early epicenter mapping, focused relief deployment, and infrastructure reinforcement based on seismic origin points.

In the post-test, performance improved across categories. The number of learners in the excellent category increased to 21 (17.50%). These learners provided clearer explanations and more structured plans for disaster response. They were able to relate the concept of seismic energy transmission to real-world applications, such as emergency zoning and retrofitting buildings in areas near the epicenter. The number of proficient learners also rose to 42 (35.00%), reflecting a greater understanding of concepts, although their answers to model-based questions still showed some gaps in explanation or detail. The number of basic-level learners increased slightly to 40 (33.33%), suggesting that some learners improved from the 'needs improvement' group, although they still faced challenges in expressing their ideas precisely. The number of learners in the needs improvement category decreased to 17 (14.17%).

These findings imply that the learners developed a better ability to derive models to address challenges. The Earthquake Modeling Activity

(See Appendix J, Week 2 Day 3, Activity 2.2), in which students utilized clay to replicate various magnitudes of an earthquake, was a significant activity likely contributing to this improvement. This practical exercise enables students to physically and visually create models that reflect earthquake dynamics, thereby improving their understanding of seismic occurrences.

Furthermore, the Risk Assessment Activity, where learners used the PHIVOLCS Fault Finder app (See Appendix J, Week 2, Day 2, Activity 2.1) to identify flaws in their local area, had students create models based on actual data, thereby enhancing their capacity to forecast and depict earthquake hazards. These exercises were crucial in helping learners strengthen their skills to properly model complex issues by including them in building and assessing earthquake and fault line models. Reflecting the success of these learning activities, the post-test findings reveal that learners' abilities in developing models have much improved.

Table 7

Learners' Pre and Post Intervention Creative Problem Solving Performance as to Synthesizing of Ideas

Scores	Pre-test		Post-test		Interpretation
	F	%	F	%	
6-7	7	5.83	24	20.00	Excellent
4-5	27	22.50	38	31.67	Proficient
2-3	49	40.83	37	30.83	Basic
0-1	37	30.83	21	17.50	Needs Improvement
Total	120	100	120	100	

***Legend**: 6 - 7 Excellent, 4 – 5 Proficient, 2 – 3 Basic, 0 -1 Needs Improvement (Syracuse University, 2019)*

According to Table 7, in the pre-test, a large number of learners scored at the basic (49 or 40.83%) and needed improvement levels (37 or 30.83%). These learners often listed isolated facts and showed difficulty combining concepts. For instance, in Questions 10–12 *(See Appendix G),* many struggled to explain how different seismic waves (P, S, Rayleigh, Love) influenced earthquake damage. In Question 19, responses from these learners were too general, such as "make buildings strong," with little reference to specific wave behavior. Only seven learners (5.83%) scored in the excellent range. They provided clear and detailed responses that effectively integrated knowledge of wave types with practical design solutions. In the same open-ended item, they proposed strategies like base isolation and flexible joints, explaining how these addressed both vertical and horizontal shaking. A total of 27 learners (22.50%) reached the proficient level; they identified correct concepts but offered limited justification.

In the post-test, the number of learners at the excellent level increased to 24 (20.00%), and the proficient group rose to 38 (31.67%). These learners provided more comprehensive responses, often connecting specific wave behaviors with corresponding structural designs. For example, some mentioned how Love waves affect lateral movement and suggested flexible materials to reduce impact. The basic group slightly decreased to 37 (30.83%), and those at the needs improvement level dropped to 21 (17.50%), showing better recall of concepts, although their synthesis remained underdeveloped.

The activities, including the Group Presentation of Earthquake Safety Plans *(See Appendix J, Week 1 Day 4, Activity Presenting Safety Plans*), greatly aided in synthesizing ideas. In this exercise, learners had to compile several bits of data about earthquake hazards and safety precautions, combine their results, and present them in a logical safety plan. Learners' post-test results show that the activities helped them participate in critical thinking and synthesis, qualities reflected in.

Table 8

Learners' Pre and Post Intervention Creative Problem Solving Performance as to Flexibility in Thinking

Scores	Pre-test		Post-test		Interpretation
	F	%	F	%	
6-7	10	8.33	23	19.17	Excellent
4-5	31	25.83	38	31.67	Proficient
2-3	37	30.83	37	30.83	Basic

0-1	42	35.00	22	18.33	Needs Improvement
Total	120	100	120	100	

***Legend**: 6 - 7 Excellent, 4 – 5 Proficient, 2 – 3 Basic, 0 -1 Needs Improvement (Syracuse University, 2019)*

Table 8 presents learners' performance in the flexibility of thinking, comparing their pre-test and post-test results. In the pre-test, a large portion of learners scored at the basic (37 or 30.83%) and needed improvement (42 or 35%) levels. These learners demonstrated limited flexibility in their thinking. Their responses were often rigid and could not adjust to new ideas or perspectives. For instance, in Questions 13-15 *(See Appendix G),* many provided basic or irrelevant answers, such as focusing solely on the energy released by earthquakes without considering the effects on people and structures (Question 13), or suggesting general solutions that didn't fully address the diverse needs of different groups (Question 14). Only 10 learners (8.33%) reached the excellent level, offering thoughtful responses that considered a range of factors in their answers, such as population density, building types, and varying community needs. Their ability to consider different viewpoints and apply knowledge to diverse situations was evident in their answers.

In the post-test, the number of learners at the excellent level increased to 23 (19.17%), showing greater flexibility in thinking. The proficient group also increased to 38 (31.67%), indicating that more learners were able to think beyond basic or rigid ideas. These learners demonstrated the ability to adapt their knowledge to different contexts, offering more nuanced responses to questions, such as modifying the Earthquake Intensity Scale to serve various groups better or including tsunami risks. The basic group remained stable at 37 (30.83%), while the needs improvement group decreased to 22 (18.33%), reflecting some improvement in critical thinking and the ability to adapt ideas.

The Seismic Wave Simulation *(See Appendix J, Week 3, Day 2, Activity 3.1)* requires learners to experiment with various waveforms, encouraging them to consider the characteristics and impacts of seismic waves on different buildings with flexibility. The Tsunami Simulation Model *(See Appendix J, Week 3, Day 3, Activity 3.2)* enabled students to examine and understand the effects of tsunamis on coastal towns, promoting adaptive reasoning about the cause-and-effect dynamics between seismic events and natural catastrophes. These exercises compelled students to modify their reasoning in response to new knowledge and varying settings, enhancing their adaptability in problem-solving.

Table 9

Assessment of Lesson Delivery for SSCS model as to Subject Experts

	Indicators	Mean	VI
1.	The teacher creates a supportive environment that encourages students to generate a wide range of ideas and solutions related to the problem.	5.00	O
2.	The teacher provides prompts and questions to stimulate students' creative thinking.	5.00	O
3.	Students actively propose multiple, diverse solutions, demonstrating creativity and critical thinking in their approach.	4.33	P
4.	Students collaborate in brainstorming sessions to generate ideas.	4.67	O
5.	Students gather relevant information from various sources to inform their ideas effectively.	4.67	O
6.	The teacher facilitates students' evaluation of the credibility and relevance of their information sources.	4.67	O
7.	The teacher uses probing questions to deepen students' understanding and prompt further exploration of their ideas.	4.67	O
8.	Students analyze and discuss the pros and cons of different proposed solutions, making informed decisions based on evidence.	4.33	P
9.	Students engage in collaborative discussions to refine their ideas and consider alternative solutions.	4.67	O
10.	Students select the most viable solution based on evidence and evaluation criteria.	4.67	O
11.	The teacher guides students in creating visual representations (diagrams, flowcharts) of their ideas and solutions.	5.00	O
12.	The teacher ensures that students have access to necessary materials and resources for creating their models.	5.00	O
13.	Students create models (diagrams, flowcharts, etc.) that visually represent their understanding and solutions to the problem.	4.67	O
14.	Students develop structured plans detailing the steps they will take to implement their chosen solutions.	4.33	P
15.	Students effectively utilize available resources to create and refine their models.	4.67	O
16.	The teacher encourages students to reflect on their initial ideas and the development process, fostering a mindset of	5.00	O

	continuous improvement.		
17.	The teacher provides timely, specific feedback on students' ideas and models, guiding them toward further improvement.	5.00	O
18.	Students are encouraged to revise and improve their ideas and models based on feedback and self-reflection.	5.00	O
19.	Students present their ideas and models clearly, articulating their thought processes and the rationale behind their decisions.	4.67	O
20.	Students are given opportunities to reflect on their learning process, discussing what worked well and what could be improved.	4.67	O
Overall		**4.73**	**O**

Mean Score Range: *4.51 – 5.00 Outstanding (O), 3.51 – 4.50 Proficient (P), 2.51 – 3.50 Developing (D), 1.51 – 2.50 Emerging (E), 1.00 – 1.50 Not Observed (NO) (Brookhart, S. M., 2013)*

As shown in Table 9, assessed by subject experts, the results for lesson delivery using the SSCS model highlight its strong impact on fostering creative problem-solving among learners. With an overall average score of 4.73, the SSCS model is viewed as highly effective in promoting creative problem-solving in the classroom. The teacher's role in creating a supportive environment for idea generation and helping students visualize their ideas through diagrams and flowcharts received exemplary ratings of 5.00. This is supported by activities like "Are you in a Safe Location?" *(See Appendix J, Week 1 Day 3*) wherein students were able to determine safe and unsafe areas for earthquakes using the Philippine Map and proposing safety measure after, also the activity entitled "Shake and Rate" *(See Appendix J, Week 4 Day 2, Activity 1*) wherein the learners simulate an earthquake using a DIY shake table and rate the effects on various objects. This indicates that the SSCS model successfully supports an environment where students feel encouraged to think creatively and engage in the problem-solving process.

In terms of learners' actions, the model effectively encouraged creativity and critical thinking. Although learners actively proposed diverse solutions and participated in brainstorming sessions, there were slightly lower scores (4.33) for activities such as analyzing the pros and cons of proposed solutions and formulating structured plans like the Performance Task entitled "Community Earthquake Preparedness Campaign" *(See Appendix J, Week 1 Day 5*) wherein the students applied their understanding of faults to make a campaign in forms of poster or drill plan. These areas indicate that, although learners were involved in the creative process, there is still room for improvement in deepening their analytical thinking and developing more organized approaches to problem-solving.

Overall, the high mean score of 4.73 suggests that the SSCS model has a substantial positive impact on learners' creative problem-solving abilities, cultivating a mindset where learners not only explore multiple solutions but also refine their ideas based on evidence and critical evaluation.

It is important to note that *no Standard Deviation (SD) is presented in the table***,** as the assessment was conducted by *only two experts—the School Principal and the Master Teacher***.** With such a limited number of raters, calculating standard deviation would not yield meaningful variability data.

Table 10

Assessment of Lesson Delivery for SSCS model as to Student Perception

		Mean	**SD**	**VI**
1.	The SSCS learning model helped me better understand how to solve science problems.	4.93	0.25	E
2.	I feel more confident tackling real-world science problems after using SSCS	4.96	0.20	E
3.	The "Search" step helped me find useful information to solve science problems.	4.97	0.18	E
4.	The "Solve" step made me think of more effective ways to address science challenges.	4.95	0.22	E
5.	SSCS has made me more interested in solving real-life science problems.	4.96	0.20	E
6.	The SSCS process helped me think critically about science concepts.	4.92	0.26	E
7.	The "Search" step improved my ability to gather and evaluate science information.	4.94	0.24	E
8.	The "Solve" step encouraged me to think deeply about science problems and possible solutions.	4.92	0.28	E
9.	The "Create" step pushed me to approach science problems in innovative ways.	4.93	0.25	E

10.	SSCS made me reflect more on the steps involved in solving science challenges.	4.97	0.18	E
11.	The "Share" step helped me express my ideas clearly to my classmates and teacher.	4.90	0.30	E
12.	SSCS made me better at working with my classmates on solving science problems.	4.98	0.13	E
13.	I enjoyed sharing and discussing ideas with others during the SSCS activities	4.95	0.22	E
14.	The SSCS model improved my ability to collaborate and learn from my classmates.	4.96	0.20	E
15.	I feel more confident explaining my thought process after using SSCS in science class.	4.97	0.16	E
Overall		4.95	0.22	E

Mean Score Range: *4.51 – 5.00 Excellent (E), 3.51 – 4.50 Very Good (VG), 2.51 – 3.50 Good (G), 1.51 – 2.50 Limited (L), 1.00 – 1.50 Ineffective (IE) (Panadero, E., Andrade, H., & Brookhart, S. M. (2021)*

As shown in Table 10, student perceptions of the SSCS model are overwhelmingly positive, with an overall mean score of 4.95, indicating excellent effectiveness. Learners felt that the model helped them better understand science problems, think critically, and approach challenges in innovative ways. The "Search" step (mean: 4.97) helped learners effectively gather relevant information, as evident in activities like Watching news clips about the Philippine Fault Zone *(See Appendix J, Week 1 Day 1, Establishing Lesson Purpose*) wherein the learners watched the video clip and answer some process questions, Activity entitled "Map Me" *(See Appendix J, Week 1 Day 1,*) also helped learners to gather relevant information by locating earthquake-prone countries using a Map and how their locations relate to their seismic activities while the "Solve" step (mean: 4.95) encouraged them to think critically about possible solutions like activity about the Seismic Wave Simulation *(See Appendix J, Week 3 Day 2, Activity 3.1*) that let the learners experiment with many waveforms, encouraging them to consider the characteristics and impacts of seismic waves on various buildings with flexibility.

The "Create" step (mean: 4.93) pushed learners to approach problems in creative and innovative ways, like the activity entitled "Shake and Rate" *(See Appendix J, Week 4 Day 2, Activity 1*) wherein the learners simulate an earthquake using a DIY shake table and rate the effects on various objects The model also increased learners' confidence (mean: 4.96) in solving real-world science problems and explaining their thought processes (mean: 4.97) activity like Group Presentation of Earthquake Safety Plans *(See Appendix J, Week 1 Day 4, Activity Presenting Safety Plans*) greatly help since this allowed learners to present their work and were able to generate feedback ang suggestions from their peers. Additionally, the collaborative aspects of the SSCS model (mean: 4.96) helped learners improve their ability to work with peers, refine their ideas, and develop solutions, including activities such as Roleplay on Tsunami Warnings, where students, together with their group, practice receiving tsunami warnings and following evacuation safety procedures. Overall, the SSCS model is highly effective in promoting creative problem-solving and critical thinking, providing learners with the necessary tools and confidence to tackle complex scientific challenges.

Table 11

Significant Difference between the Creative Problem-Solving performance of Grade 7 Learners before and after the implementation of the Search, Solve, Create and Share (SSCS) Model

Legend: *p ≤ 0.05- significant, p ≥ 0.05 – not significant*

	Pre-Test		**Post-Test**		**t-value**	**df**	**p-value**
Creative Problem-Solving	**Mean**	**SD**	**Mean**	**SD**			
Creative Imagining	2.63	1.59	3.69	1.8	-9.36	119	< .001
Making Inference	2.76	1.79	3.64	1.86	-8.55	119	< .001
Deriving Models	2.81	1.78	3.72	1.92	-6.56	119	< .001
Synthesizing Ideas	2.67	1.53	3.62	1.86	-7.39	119	< .001
Flexibility in Thinking	2.68	1.67	3.67	1.88	-9.23	119	< .001

Table 11 illustrates significant improvements in the creative problem-solving abilities of Grade 7 learners following the implementation of the Search, Solve, Create, and Share (SSCS) model. The learners demonstrated substantial advancements in all five domains of creative problem-solving:

Creative Imagining, Making Inferences, Deriving Models, Synthesizing Ideas, and Flexibility in Thinking. These improvements were statistically significant, with p-values < 0.001, indicating that the changes were highly unlikely to have occurred by chance.

The learners demonstrated changes in their approach to scientific scenarios after participating in the intervention. During the *creative imagining* tasks, learners began offering responses with clearer structure and more direct applications of scientific ideas. For instance, in the activity on community-specific disaster preparedness, learners progressed from general suggestions to targeted, context-based plans. In the *making inferences* domain, the PHIVOLCS Fault Finder activity *(Appendix J, Week 2 Day 2, Activity 2.1)* helped learners interpret fault data with more accuracy. Their post-test responses included more accurate geological interpretations and justified strategies related to tectonic activity. For *deriving models*, learners' understanding of earthquake dynamics improved following the Earthquake Modeling Activity using clay *(Appendix J, Week 2 Day 3, Activity 2.2)*. They transitioned from unrelated representations to models that reflected seismic behavior with more alignment to scientific concepts.

Activities such as the group presentation of Earthquake Safety Plans *(Appendix J, Week 1, Day 4*) encouraged students to relate structural interventions to wave behavior, thereby synthesizing concepts. A more comprehensive synthesis of seismic wave properties and their effects on building safety was evident in post-test answers. Last but not least, the Tsunami Simulation Model *(Appendix J, Week 3 Day 3, Activity 3.2)* and the Seismic Wave Simulation *(Appendix J, Week 3 Day 2, Activity 3.1)* allowed students to modify their reasoning in response to various situations and settings. More diverse concerns, such as modifying safety procedures to account for local topography and wave types, were incorporated into their post-test responses.

All of the categories' p-values were less than 0.001, indicating that the findings were statistically significant. This provides support for the idea that the SSCS model is effective in developing students' capacity for creative problem-solving. This finding is consistent with research by Leung et al. (2020) and Ho et al. (2021), who found that structured phases of problem-solving, including searching, solving, creating, and sharing, significantly enhance students' cognitive skills, such as creativity and critical thinking. Furthermore, studies by Zhang and Zhu (2020) demonstrate that these models enable students to develop their unique problem-solving abilities while fostering collaboration and the ability to integrate different ideas—two key components of the SSCS model.

The results show a significant difference in the creative problem-solving performance of Grade 7 students before and after the Search, Solve, Create, and Share (SSCS) model was implemented. The model's structured but flexible framework encourages students to solve complex scientific problems creatively on their own, giving them the confidence and competence to do so.

Chapter 5

SUMMARY, CONCLUSIONS AND RECOMMENDATION

The findings, conclusions, and recommendations based on the study's findings are presented in this chapter.

Summary of Findings

This study examined the creative problem-solving skills of Grade 7 learners before and after the implementation of the Search, Solve, Create, and Share (SSCS) model. The evaluation also analyzed the lesson's implementation of the SSCS model using expert observations and student perspectives. The study aimed to examine different aspects of the learners' profiles, including their quarterly performance, prior knowledge, proficiency in basic scientific processes, and creative problem-solving skills across five key domains: creative imagination, inference-making, model derivation, idea synthesis, and cognitive flexibility. The researcher employed frequency distribution, percentage, standard deviation, and paired t-test as statistical measures.

1. The profile of the learners in terms of quarterly performance generally fell into the outstanding and fairly satisfactory categories. In terms of prior knowledge, the learners generally fell within the moderate to limited prior knowledge groups. Lastly, in terms of proficiency in basic science process skills, the learners exhibited a wide range of capabilities. A small group demonstrated an outstanding level of proficiency, while the majority showed satisfactory to very satisfactory levels of understanding.

2. Students exhibited significant improvements in their creative imagining. Before the intervention, several students were classified as needing improvement; however, after the intervention, many students progressed to the proficient and excellent categories. In terms of the ability to make inferences, learners initially categorized as "needs improvement" showed an increase and moved in the "excellent" category following post-test results.

   In terms of deriving models**,** the pre-test revealed that the majority of learners were grouped for needed improvement; yet, following the intervention, many learners progressed to excel and proficient levels. Regarding synthesizing ideas, the post-intervention data showed that learners' capacity to combine several bits of knowledge improved. Lastly, the greatest improvements were observed in flexibility in thinking. Most of the learners, after the post-test moved to the excellent category

3. Experts observed that the teacher created a nurturing atmosphere that fostered creative problem-solving and critical thinking. The teacher provided students with essential materials and promoted continuous growth through immediate feedback. While in terms of student perception, learners generally expressed positive reactions to the SSCS model. The "Search" phase was recognized for its effectiveness in helping students collect relevant data, while the "Solve" stage promoted enhanced critical thinking and more effective solutions. The "Create" phase encouraged students to engage in creative thinking, while the "Share" phase facilitated the straightforward expression of their ideas.

4. There is a significant difference in the creative problem-solving performance of Grade 7 learners before and after the implementation of the Search, Solve, Create and Share (SSCS) Model.

Conclusion

Based on the findings, the hypothesis that there is no significant change in the creative problem-solving ability of Grade 7 students before and after implementing the Search, Solve, Create, and Share (SSCS) model is not supported. All five of the fundamental components of creative problem-solving—creative imagining, making inferences, deriving models, synthesizing ideas, and thinking with flexibility—saw significant improvements in the study. Statistical analysis supported these improvements, showing that learners' cognitive abilities had significantly improved (p-values below 0.001). This implies that the SSCS model greatly enhanced students' capacity for creative problem-solving, encouraging more innovative approaches to challenging scientific issues.

Recommendations

Using the findings and conclusions as bases, the following recommendations are

suggested by the researcher:

1. Educators may integrate the Search, Solve, Create, and Share (SSCS) model into day-to-day lessons, utilizing the four phases in exploratory labs, problem sets, and performance tasks. By making SSCS a routine structure rather than a one-off intervention, teachers provide learners with repeated practice in framing problems, generating solutions, building models, and communicating results—processes that this study found to be strongly associated with higher creative problem-solving abilities.
2. Educators are recommended to give fast, helpful feedback at every SSCS stage. Short notes, peer comments, or checklists during the Search, Solve, Create, and Share phases guide learners to correct mistakes and refine their work, building steady gains in creative thinking.
3. Schools are encouraged to facilitate training sessions on the SSCS model for teachers. Workshops, demo lessons, and peer coaching help staff share tips and solve problems together, leading to a stronger and more consistent use of the model across classes.
4. Learners are recommended to keep a simple SSCS journal. After each cycle, they jot down what they found, why they chose a solution, a picture of their model, and what they learned from sharing. This habit lets them track progress and plan what to improve next time.

5. Future researchers may examine how long the SSCS model's benefits last. Follow-up tests six months or a year later, comparing classes that continue using SSCS with those that do not, can show what helps the creative problem-solving boosts stay strong over time.

REFERENCES:

1. Afriana, J., Rahmawati, Y., & Ha, M. (2021). Enhancing creative thinking skills through STEM-integrated science learning. *Journal of Science Learning, 4*(1), 33–41. https://doi.org/10.17509/jsl.v4i1.27967
2. Alabbasi, A. and Cramond, B. (2018). The creative problem finding hierarchy: a suggested model for understanding problem finding. Creativity Theories – Research – Applications, 5(2), 197-229. https://doi.org/10.1515/ctra-2018-0019
3. Alenchery et al., "Barriers and enablers to skin-to-skin contact at birth in healthy neonates
4. Ali et al., "Prevalence and factors associated with skin-to-skin contact (SSC) practice: findings from a population-based cross-sectional survey in 10 selected districts of Bangladesh," *BMC Pregnancy and Childbirth*, 2021, doi:10.1186/s12884-021-04189-3.
5. Almutairi and Ludington-Hoe, "Kangaroo Care Education Effects on Nurses' Knowledge and Skills Confidence," *The Journal of Continuing Education in Nursing*, 2016, doi:10.3928/00220124-20161017-11.
6. Amran, M., Kutty, F., & Surat, S. (2019). Creative problem-solving (cps) skills among university students. Creative Education, 10(12), 3049-3058. https://doi.org/10.4236/ce.2019.1012229
7. Arfandi, A., Wulandari, S., Agung, M., & Mappalotteng, A. (2023). Assessing the impact of creative problem-solving educational models on students' ability to think creatively. *Proceedings Title*, volume number, 191–198. https://doi.org/10.2991/978-2-38476-084-8_26
8. Arisa, S., Khaldun, I., & Safrida, S. (2021). The effect of search, solve, create and share learning models to improve students 'critical thinking skills on acid and basic titration materials. Jurnal Penelitian Pendidikan Ipa, 7(2), 191-195. https://doi.org/10.29303/jppipa.v7i2.625
9. *Asrial, Syahrial, Luthfi, & Nugroho. (2020).* Science process skill ability level of senior high school students in learning chemistry in Jambi. *Academia.edu*. https://www.academia.edu/66191627/Science_Process_Skill_Ability_Level_Of_Senior_High_School_Students_In_Learning_Chemistry_In_Jambi
10. Awalia, U., Subiyantoro, S., & Margana, M. (2022). Analysis of 12th-grade student creative thinking abilities in theatre art concept for cultural art. *Proceedings Title*. https://doi.org/10.4108/eai.9-10-2021.2319691
11. Batlolona, J., Diantoro, M., & Leasa, M. (2020). Students' mental models of solid elasticity: A mixed-method study. *Journal of Turkish Science Education, 17*(2), 199–209. https://doi.org/10.36681/tused.2020.21
12. Bellocchi et al., "Predicting the Progression of Very Early Systemic Sclerosis: Current Insights," *Open Access Rheumatology Research and Reviews*, 2022, doi:10.2147/oarrr.s285409.
13. Brookhart, S. M. (2013). *How to create and use rubrics for formative assessment and grading*. Alexandria, VA: ASCD.
14. Buijs, J., Smulders, F., & Meer, H. (2009). Towards a more realistic creative problem solving approach. Creativity and Innovation Management, 18(4), 286-298. https://doi.org/10.1111/j.1467-8691.2009.00541.x
15. Caponero et al., "The Effect of Video Education on Skin-to-Skin Contact at the Time of Delivery: A Randomized Controlled Trial," *American Journal of Perinatology Reports*, 2022, doi:10.1055/s-0041-1741540.
16. Chen, P., & Chan, Y. (2021). Enhancing creative problem-solving in postgraduate courses of education management using project-based learning. *International Journal of Higher Education, 10*(6), 11. https://doi.org/10.5430/ijhe.v10n6p11
17. Chinn, C. (2023). Designing learning environments to promote competent lay engagement with science. *European Journal of Education, 58*(3), 407–421. https://doi.org/10.1111/ejed.12573
18. Delos Reyes, J. A. (2022). Enhancing student engagement in Earth Science through modified inquiry-based learning: An action research in a public high school in Cavite. *Philippine Journal of Science Education, 5*(2), 78–95.
19. Diani, R., Herliantari, H., Irwandani, İ., Saregar, A., & Umam, R. (2019). Search, solve, create, and share (sscs) learning model: the impact on the students' creative problem-solving ability on the concept of substance pressure. Jurnal Penelitian Fisika Dan Aplikasinya (Jpfa), 9(1), 65. https://doi.org/10.26740/jpfa.v9n1.p65-77
20. Elvanuari et al., "Development of e-worksheet based on search, solve, create, and share (SSCS) Islamic context to improve science process skills on excretory system material," *Jpbi (Jurnal Pendidikan Biologi Indonesia)*, 2024, doi:10.22219/jpbi.v10i1.31560.
21. Fatmawati, B., Jannah, B., & Sasmita, M. (2022). Students' creative thinking ability through creative problem-solving-based learning. *Jurnal Penelitian Pendidikan IPA, 8*(4), 2384–2388. https://doi.org/10.29303/jppipa.v8i4.1846
22. Fauziyah, A. N., Budiyono, & Riyadi. (2020). The influence of SSCS learning model on students' creative thinking skills in mathematics. *Journal of Mathematics Education Research, 9*(1), 22–30. https://doi.org/10.21831/jmer.v9i1.31762
23. Garcia, R. M., Ramirez, A., & Torres, J. (2020). Enhancing scientific literacy through the SSCS model in multicultural classrooms. *International Journal of Science Education, 42*(3), 305–321. https://doi.org/10.1080/09500693.2020.1719991
24. Haavold, P., & Sriraman, B. (2021). Creativity in problem solving: Integrating two different views of insight. *ZDM, 54*(1), 83–96. https://doi.org/10.1007/s11858-021-01304-8
25. Handayani, A., Syukri, M., & Elisa, E. (2021). The effectivity of search, solve, create, and share (sscs) learning model on improving the critical thinking skills of students in sma 9 banda aceh.. https://doi.org/10.2991/assehr.k.210909.069
26. Ho, K. K., Tan, C. M., & Lee, J. H. (2021). Enhancing critical thinking through collaborative problem-solving strategies: Evidence from a structured problem-solving approach. *Educational Psychology Review, 33*(3), 899-918. https://doi.org/10.1007/s10648-020-09563-6
27. Ihsan, R., Feronika, T., & Bahriah, E. (2023). The effect of search, solve, create and share (sscs) learning model on students' scientific literacy. Jurnal Pendidikan Indonesia Gemilang, 3(2), 295-305. https://doi.org/10.53889/jpig.v3i2.242

28. Indah Hanifah Munawaroh. (2022). DEVELOPMENT OF E-LKPD BASED ON THE SSCS (SEARCH, SOLVE, CREATE, AND SHARE) MODEL IN SCIENCE LESSONS FOR CLASS V STUDENTS IN ELEMENTARY SCHOOL. *Elementary School*, *9*(2), 121–125. https://doi.org/10.31316/esjurnal.v9i2.2549
29. Janah, E. (2023). The effect of SSCS learning model with metaphor approach on mathematics problem-solving ability in review of students' learning styles. *Jurnal Pendidikan Matematika dan IPA, 14*(2), 234. https://doi.org/10.26418/jpmipa.v14i2.56388
30. Kavaii et al., "Animal Organ Dissections in High Schools: Is There More than just Cutting?" *African Journal of Research in Mathematics Science and Technology Education*, 2015, doi:10.1080/10288457.2015.1049011.
31. Khalid, M., Saad, S., Hamid, S., Abdullah, M., Ibrahim, H., & Shahrill, M. (2020). Enhancing creativity and problem-solving skills through creative problem-solving in teaching mathematics. *Creativity Studies, 13*(2), 270–291. https://doi.org/10.3846/cs.2020.11027
32. Kholifah et al., "Evidence of positive influence: soft skills competence and organizational culture on innovative work behavior," *Journal of Education and Learning (EduLearn)*, 2024, doi:10.11591/edulearn.v18i4.21018.
33. Kim, H., & Choi, K. (2021). Implementing the SSCS model in biology education: An experimental study in South Korean high schools. *Journal of Biological Education, 55*(4), 367–381. https://doi.org/10.1080/00219266.2020.1824846
34. Lee, C., Lai, H., Lee, C., Chen, M., & Yau, S. (2023). Collaborative clinical reasoning: a scoping review.. https://doi.org/10.1101/2023.02.09.23285741
35. Leung, W. M., Lee, K. W., & Choi, M. (2020). The impact of structured problem-solving activities on fostering creativity in secondary school science education. *Science Education International, 31*(1), 11-21. https://doi.org/10.3389/fpsyg.2020.00357
36. Liem et al., "Physical therapy in patients with systemic sclerosis: physical therapists' perspectives on current delivery and educational needs," *Scandinavian Journal of Rheumatology*, 2021, doi:10.1080/03009742.2021.1937306.
37. Maharani, D. A., & Yuliati, L. (2022). SSCS-based learning to improve scientific creativity in middle school students. *Jurnal Pendidikan Sains, 10*(3), 145–153. https://doi.org/10.17977/jps.v10i3.15867
38. Mardianti, I., Masriyah, M., & Wijayanti, P. (2018). Students' creative thinking process based on the wallas stage in solving mathematical modeling problems.. https://doi.org/10.2991/miseic-18.2018.38
39. Maulyda, M., & Umar, U. (2021). Creative problem-solving learning model on students' ability in determining networks of cuboids and cubes. *Journal of Innovative Mathematics Learning, 4*(3), 109–116. https://doi.org/10.22460/jiml.v4i3.p109-116
40. McFadzean, E. (1998). The creativity continuum: towards a classification of creative problem solving techniques. Creativity and Innovation Management, 7(3), 131-139. https://doi.org/10.1111/1467-8691.00101
41. Mendoza-Muñoz, M., Carlos-Vivas, J., Villafaina, S., Parraça, J., Vega-Muñoz, A., Contreras-Barraza, N., & Raimundo, A. (2022). Effects of a physical literacy breaks (PLBreaks) program on physical literacy and body composition in Portuguese schoolchildren: A study protocol. *Biology*, *11*(6), 910. https://doi.org/10.3390/biology11060910
42. Merriënboer, "Perspectives on problem solving and instruction," *Computers & Education*, 2013, doi:10.1016/j.compedu.2012.11.025.
43. Mogari, D., & Lupahla, N. (2013). Mapping a group of Northern Namibian Grade 12 learners' algebraic non-routine problem-solving skills. *African Journal of Research in Mathematics, Science and Technology Education, 17*(1–2), 94–105. https://doi.org/10.1080/10288457.2013.826974
44. Motta, S., Putra, P., & Sundari, E. (2022). The effect of SSCS model on students' science process skills and learning outcomes. *International Journal of Instruction, 15*(2), 115–130. https://doi.org/10.29333/iji.2022.1527a
45. Munawaroh, I. (2022). Development of E-LKPD based on the SSCS (Search, Solve, Create, and Share) model in science lessons for Class V students in elementary school. *Elementary School Jurnal Pendidikan dan Pembelajaran Ke-SD-an, 9*(2), 121–125. https://doi.org/10.31316/esjurnal.v9i2.2549
46. Nasir, M., & Hayya, A. (2023). The effect of Search, Solve, Create, Share (SSCS) learning model on scientific reasoning ability. *Bioeduca Journal of Biology Education, 5*(1), 52–65. https://doi.org/10.21580/bioeduca.v5i1.15067
47. Nastiti, D., Rahardjo, S., Vh, E., & Perdana, R. (2018). The need analysis of module development based on Search, Solve, Create, and Share to increase generic science skills in chemistry. *Jurnal Pendidikan IPA Indonesia, 7*(4). https://doi.org/10.15294/jpii.v7i4.12393
48. Novitasari, D., Triutami, T., Wulandari, N., Rahman, A., & Alimuddin, A. (2020). Students' creative thinking in solving mathematical problems using various representations. *Advances in Social Science, Education, and Humanities Research.* https://doi.org/10.2991/assehr.k.200827.026
49. Oh, K. (2017). Integrating creative problem solving into the field of fashion education. Fashion Industry and Education, 15(1), 59-65. https://doi.org/10.7741/fie.2017.15.1.059
50. Oktaviani, I., & Jailani, J. (2020). *Enhancing students' reflective thinking ability through Search-Solve-Create-Share learning model*. Journal of Mathematics Education, 9(1), 29–36. Retrieved from https://files.eric.ed.gov/fulltext/EJ1250378.pdf
51. Olipas, C. (2024). A qualitative exploration of the Matatag Curriculum's perceived impact on history and geography education in the school year 2024–2025. *European Journal of Theoretical and Applied Sciences, 2*(1), 526–531. https://doi.org/10.59324/ejtas.2024.2(1).45
52. Panadero, E., Andrade, H., & Brookhart, S. M. (2021). Clarifying rubrics: Five performance levels that students understand. *Educational Measurement: Issues and Practice*, 40(2), 68–77. https://doi.org/10.1111/emip.12398
53. Permata, S., Sunarno, W., & Harlita, H. (2022). Effect of the problem-based learning and double-loop problem-solving learning models on problem-solving ability in terms of creative thinking on environmental pollution material. *Jurnal Penelitian Pendidikan IPA, 8*(6), 2647–2653. https://doi.org/10.29303/jppipa.v8i6.1996
54. Pertiwi, H. (2022). Developing science module of problem-based learning to improve critical thinking skill. *Physics and Science Education Journal (PSEJ), 2*(1), 1–8. https://doi.org/10.30631/psej.v2i1.1213

55. Puccio, G. (1999). Creative problem solving preferences: their identification and implications. Creativity and Innovation Management, 8(3), 171-178. https://doi.org/10.1111/1467-8691.00134
56. Putri et al., "Review of Learning Result of The Physics Base on SSCS (Search, Solve, Create, and Share) Model in Terms of Critical Thinking Skills," *Journal of Physics Conference Series*, vol. 2243, no. 1, 2022, doi:10.1088/1742-6596/2243/1/012113.
57. Putri, L. Y., Handayani, W., & Sari, N. (2022). SSCS model and peer learning: Impact on science achievement. *Jurnal Pendidikan IPA Indonesia, 11*(1), 72–80. https://doi.org/10.15294/jpii.v11i1.33780
58. Putri, Q., Suharno, S., & Budiawanti, S. (2022). Review of learning result of the physics base on sscs (search, solve, create, and share) model in terms of critical thinking skills. Journal of Physics Conference Series, 2243(1), 012113. https://doi.org/10.1088/1742-6596/2243/1/012113
59. Rahman, S., Ahmad, R., & Zakaria, Z. (2020). Problem-based learning in physics: Enhancing creative problem-solving skills. *Journal of Physics Education, 52*(1), 22–38. https://doi.org/10.1088/1361-6404/ab54a5
60. Reiter-Palmon, R. and Illies, J. (2004). Leadership and creativity: understanding leadership from a creative problem-solving perspective. The Leadership Quarterly, 15(1), 55-77. https://doi.org/10.1016/j.leaqua.2003.12.005
61. Rogayan Jr, D. V., & Dantic, M. J. P. (2021). Backliners: Roles of science educators in the post-COVID milieu. *Aquademia, 5*(2), ep21010.
62. Rosiani, R., Suciati, S., & Sunarno, W. (2021). The effectiveness of Search, Solve, Create, and Share (SSCS) learning model to improve students' creative thinking skills in biology. *Journal of Physics: Conference Series, 1842*(1), 012031.
63. Saddhono, C. (2021). The analysis of “Search, Solve, Create, Share” learning model using Schoology apps: Indonesian syntax learning. *Psychology and Education Journal, 58*(2), 4702–4710. https://doi.org/10.17762/pae.v58i2.2857
64. Sæleset and Friedrichsen, "A Case Study of Specialized Science Courses in Teacher Education and Their Impact on Classroom Teaching," *Journal of Science Teacher Education*, 2021, doi:10.1080/1046560x.2021.1971859.
65. Safitri, N. (2024). Enhancing students’ creativity in problem-solving through online reading-concept mapping-group investigation. *International Journal of Evaluation and Research in Education (IJERE), 13*(2), 1069. https://doi.org/10.11591/ijere.v13i2.26655
66. Salazar, S. (2020). Utilization of inquiry-based approaches in teaching science and its effect to learners’ performance in Governor Feliciano Leviste Memorial National High School. *International Multidisciplinary Research Journal, 2*(1). https://doi.org/10.54476/iimrj383.2.1
67. Sánchez-Espino et al., "An educational intervention to implement skin-to-skin contact and early breastfeeding in a rural hospital in Mexico," *International Breastfeeding Journal*, 2019, doi:10.1186/s13006-019-0202-4.
68. Saregar et al., "Temperature and Heat Learning Through SSCS Model with Scaffolding: Impact on Students’ Critical Thinking Ability," *Journal for the Education of Gifted Young Scientists*, 2018, doi:10.17478/jegys.2018.80.
69. Saro, J. (2024). A qualitative exploration on the perceived impact of the Matatag Curriculum on basic education teaching in the school year 2024–2025. *IJAMRS, 4*(4), 952–966. https://doi.org/10.62225/2583049x.2024.4.4.3134
70. Scherer and Beckmann, "The acquisition of problem-solving competence: Evidence from 41 countries that math and science education matters," *Large-scale Assessments in Education*, 2014, doi:10.1186/s40536-014-0010-7.
71. Singh et al., "Work productivity in scleroderma: Analysis from the University of California, Los Angeles scleroderma quality of life study," *Arthritis Care & Research*, 2012, doi:10.1002/acr.20676.
72. Spierings et al., "Optimal care for systemic sclerosis patients: recommendations from a patient-centered and multidisciplinary mixed-method study and working conference," *Clinical Rheumatology*, 2018, doi:10.1007/s10067-018-4358-x.
73. Subanji, S., Nusantara, T., Rahmatina, D., & Purnomo, H. (2021). The statistical creative framework in descriptive statistics activities. *International Journal of Instruction, 14*(2), 591–608. https://doi.org/10.29333/iji.2021.14233a
74. Suryawati, E., Yennita, Y., Afwa, S., Dianti, P., & Syafrinal, S. (2023). Real action based on search solve create and share (sscs) model to improve sustainability awareness of junior high school students. Jpbi (Jurnal Pendidikan Biologi Indonesia), 9(3), 271-281. https://doi.org/10.22219/jpbi.v9i3.28940
75. Syafri, M., Zulkarnain, Z., & Maimunah, M. (2020). The effect of SSCS learning model on the mathematical problem-solving ability of junior high school students, Kampar Regency. *Journal of Educational Sciences, 4*(2), 309. https://doi.org/10.31258/jes.4.2.p.309-317
76. Syracuse University. (2019). *Rubric roadmap: A guide to developing rubrics*. Office of Institutional Effectiveness and Assessment. Retrieved from https://effectiveness.syr.edu/wp-content/uploads/2019/07/FOTL-Rubric-Roadmap.pdf
77. Uhlen et al., "Stainless-steel crowns in children: Norwegian and Finnish dentists’ knowledge, practice and challenges," *BMC Oral Health*, 2021, doi:10.1186/s12903-021-01556-6.
78. Ulya, F. (2023). The development of science learning tools with the SSCS model integrated with Islamic values to improve critical thinking skills. *Journal of Innovative Science Education, 12*(2), 208–214. https://doi.org/10.15294/jise.v12i2.71962
79. Verawati, N. (2023). Challenges of multidimensional science education: A philosophical perspective. *Jurnal Pijar Mipa, 18*(6), 892–897. https://doi.org/10.29303/jpm.v18i6.5701
80. Villanueva, M. L. (2023). Project-based learning and environmental awareness: A study of Grade 9 students in Lopez, Quezon. *Quezon Journal of Environmental Studies, 8*(1), 112–128.
81. Yanto, F., Festiyed, F., & Enjoni, E. (2021). Problem-based learning model for increasing problem-solving skills in physics learning. *JIPF (Jurnal Ilmu Pendidikan Fisika), 6*(1), 53. https://doi.org/10.26737/jipf.v6i1.1870
82. Yasin, M., Fakhri, J., Siswadi, S., Faelasofi, R., Safi’i, A., Supriadi, N., … & Wekke, I. (2020). The effect of SSCS learning model on reflective thinking skills and problem-solving ability. *European Journal of Educational Research, 9*(2), 743–752. https://doi.org/10.12973/eu-jer.9.2.743
83. Yuen et al., "Factors associated with gingival inflammation among adults with systemic sclerosis," *International Journal of Dental Hygiene*, 2013, doi:10.1111/idh.12024.

84. Zhang, W., & Zhu, Z. (2020). Improving student creativity through the use of creative problem-solving frameworks in science education. *Thinking Skills and Creativity*, *37*, 100694.