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Systematic Literature Review: SSCS (Search, Solve, Create and Share) Learning Model on The Understanding and Mastery of Physics Concepts

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Abstract: *This study aimed to explore and evaluate the effects of the SSCS (Search, Solve, Create dan Share) model on the understanding and mastery of physics concepts. The research employed a Systematic Literature Review (SLR) with a PRISMA framework, involving stages such as identification, screening, assessing eligibility, and selecting final articles for analysis. Data were gathered from the Scopus, Google Scholar and Garuda databases, focusing on articles published between 2014 and 2024. The search process identified 6 articles relevant discussing the SSCS learning model and its impact on understanding and mastering physics concepts. The results revealed that the SSCS model significantly enhanced the understanding and mastery of physics concepts. Research on the SSCS model focusing on enhancing the understanding and mastery of physics concepts remains highly limited. Therefore, further implementation of this instructional model in physics education is highly recommended.*

Keywords: *systematic literature review, SSCS, concept understanding, concept mastery, physics*

Tinjauan Pustaka Sistematis: Model Pembelajaran SSCS (*Search, Solve, Create* dan *Share*) Terhadap Pemahaman dan Penguasaan Konsep Fisika

Abstrak: Penelitian ini bertujuan untuk mengidentifikasi dan menjelaskan pengaruh model SSCS (*Search, Solve, Create* dan *Share*) terhadap pemahaman serta penguasaan konsep fisika. Metode yang digunakan dalam penelitian ini adalah *Systematic Literature Review* (SLR) dengan desain PRISMA yang mencakup tahapan identifikasi, penyaringan, evaluasi kelayakan, hingga pemilihan artikel untuk dianalisis lebih lanjut. Data diperoleh dari database Scopus, Google Scholar dan Garuda dengan artikel yang dipublikasikan dalam rentang waktu 2014 hingga 2024. Proses pencarian menghasilkan 6 artikel yang layak untuk diteliti karena berfokus pada model pembelajaran SSCS serta pengaruhnya terhadap pemahaman dan penguasaan konsep dalam pembelajaran fisika. Hasil penelitian ini menunjukkan bahwa model SSCS berkontribusi pada peningkatan pemahaman dan penguasaan konsep fisika. Penelitian terkait model SSCS yang berfokus pada peningkatan pemahaman dan penguasaan konsep fisika masih sangat terbatas. Oleh karena itu, model pembelajaran ini sangat direkomendasikan untuk diterapkan lebih lanjut dalam pembelajaran fisika.

Kata kunci: fisika, pemahaman konsep, penguasaan konsep, SSCS, sistematika kajian literatur

INTRODUCTION

Physics education is a field that requires an in-depth conceptual understanding to improve problem-solving skills. This conceptual understanding is an important part of 21st-century skills, which are needed to prepare the younger generation to face various challenges in the future. The factors related to the understanding of physics concepts are connected to the learning model (Entino et al., 2022 ; Auli et al., 2018). In an era of ever-evolving education, learning models are a primary concern for educators and researchers in improving students' conceptual understanding. Conceptual understanding involves the construction of schematic models that enable students to comprehend complex physical phenomena (Wandi et al., 2024). Learning does not achieve optimal effectiveness if it solely depends on rote memorization (Wulandari & Kurniawan., 2024). Therefore, innovation in effective learning models is essential to help students understand and master physics concepts.

A learning model is a plan or set of instructional resources used as a guideline that covers all aspects of the learning process (Wahyuni et al., 2024). Choosing the right learning model is crucial to helping students understand and master physics concepts. Innovation in learning models is needed to develop students' abilities in learning physics, especially related to the concept of application in everyday life (Yunita, et al., 2020; Suliyati, et al., 2018). One learning model that has received widespread attention and actively involves students is the SSCS model. The SSCS learning model consists of four components: Search, Solve, Create, and Share (Ismet, 2022).

The SSCS model has advantages in developing various skills and competencies among students. It focuses on problem-solving, skill development, and stimulating student interest to hone problem-solving skills (Asmara & Septiana, 2023). This model provides students with the opportunity to gain direct experience in the learning process, from discovering knowledge and solving problems to making informed decisions. This process helps students gain a solid understanding that can be shared with classmates (Falah, 2018). The SSCS model is designed to involve students in investigative activities, arouse curiosity and interest in asking questions, and encourage them to solve real problems. It integrates problem-solving, creativity, and collaboration, which are aligned with the needs of 21st-century learning (Nova et al, 2023).

However, literature studies related to the SSCS learning model and its impact on the understanding and mastery of physics concepts have not yet been conducted. Therefore, a systematic review is necessary to analyze and conclude the influence of the SSCS model based on the latest research. This study aims to provide a scientific basis for the impact of innovations in physics learning models through the presentation of a systematic and comprehensive literature review. This analysis will identify, evaluate, and synthesize research relevant to this topic. The study will delve deeper into whether the SSCS learning model influences the understanding and mastery of physics concepts. This article is expected to provide valuable insights for educators, researchers, and education practitioners regarding the influence of the SSCS model on the understanding and mastery of physics concepts, based on an analysis of relevant research articles

METHOD

This study employs the Systematic Literature Review (SLR) method with the PRISMA design approach. The purpose of this method is to answer the research questions specifically through a series of stages, including identification, analysis, synthesis, evaluation, and comparison of literature relevant to the topic or problem formulation (Gegentanta, 2011). In its implementation, the researchers collected articles from the

Google Scholar and Garuda databases using keywords such as the SSCS model, understanding, concept mastery, and physics learning. The articles obtained were then selected based on predefined inclusion and exclusion criteria.

Table 1. Inclusion and Exclusion Criteria

Exclusion Criteria	Inclusion Criteria
Articles published before 2014 period	Articles published in the period 2014-2024
The research included in the development research category	The research included in the category of influence research
The research topics are not related to the SSCS learning model	The research topics focus on the SSCS model
The Study is not on physics material	The research topic is physics learning
The research variables do not discuss understanding and mastery of concepts	The research variables are understanding and mastery of concepts

Articles that met the inclusion and exclusion criteria were collected and examined systematically. The data obtained from these articles were analyzed using the narrative method. This narrative approach was used to describe various aspects, such as the subjects, types of research, samples, and the results of the application of the SSCS model.

At the data search stage, relevant articles were identified using the Google Scholar search engine with keywords such as SSCS, concept understanding, and concept mastery. The initial search yielded 788 articles distributed as follows: Scopus (200 articles), Google Scholar (548 articles), and Garuda (40 articles). The subsequent stage was the data screening process, where articles were selected based on predefined inclusion and exclusion criteria. This screening process resulted in 6 articles meeting the criteria for further analysis. The selected articles were then re-examined to ensure their methodology, validity, and relevance.

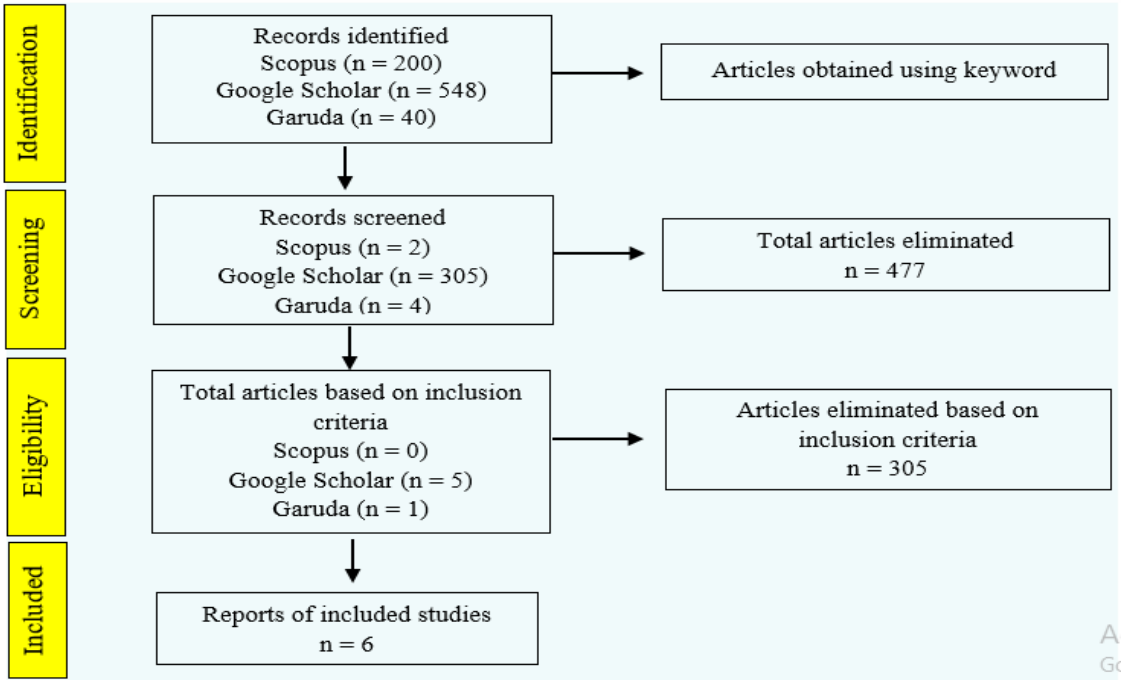

Figure 1. PRISMA Flowchart

The final stage was data analysis. The effect size was calculated using Cohen's *d* formula, which compares the mean pretest and posttest scores, taking into account their respective standard deviations. The *effect size* values were then categorized into three groups: small (0.20–0.50), medium (0.51–0.80), and large (>0.80).

RESULTS AND DISCUSSION

Based on the systematic literature review conducted, 6 articles were obtained that met the criteria for further analysis. These articles are the results of research that focuses on the application of the SSCS model in improving understanding and mastery of concepts in physics learning. The results of the analysis of the five articles are presented in Table 2.

Table 2. Results of Article Analysis of the SSCS Learning Model on Understanding and Mastery of Physics Concepts

Author	Variables	Topics	Methods	Samples	Results
Yuanita et al., 2024	Concept Understanding	Thermodynamics	Quasi Experimental	25 high school students	The SSCS learning model has an effect on the understanding of thermodynamic concepts
Yuliana et al., 2024	Mastery of Concepts	Elasticity and Hooke's Law	Quasi Experimental	XI MIPA 1 and XI MIPA 2 high school	The SSCS learning model improves students' mastery of physics concepts
Rosalia, 2019	Understanding of Concepts and Skills of the Science Process	Straight Motion	Quasi Experimental	36 High School Sudents	The SSCS learning model has an effect on understanding concepts
Astutik, 2016	Mastery of physics concepts	Temperature and Heat	Quasi Experimental	High School	The application of the SSCS model assisted by visual media has quite an effect on students' mastery of physics concepts

Author	Variables	Topics	Methods	Samples	Results
Mustofa, 2015	Mastery of Concepts	Kinetic Theory of Gases	Quasi Experimental	37 High School Students	The SSCS learning model improves students' mastery of physics concepts.
Johan, 2014	Mastery of Concepts	Dynamic Electricity	Quasi-experimental	70 Students	The learning model is significantly effective in improving students' mastery of concepts.

Based on the findings in Table 1, various studies examine the influence of the SSCS learning model on the understanding and mastery of physics concepts at the high school and college levels. One study conducted by Yuanita et al. (2024) on the influence of the SSCS model on students' conceptual understanding of thermodynamics shows that this model has a significant impact on understanding thermodynamic concepts. This is reflected in the results of the pre-test, where the experimental class had an average score of 32.00, compared to the control class, which scored 33.40. In the post-test, the experimental class obtained an average score of 81.80, higher than the control class, which only reached 68.60. The independent samples t-test showed a Sig. (2-tailed) value of 0.000, indicating a significant influence on the understanding of thermodynamic concepts.

Furthermore, Yuliana et al. (2024) in their research on the influence of the SSCS model assisted by E-LKPD on the mastery of physics concepts, also found that this model improved concept mastery. The calculation results show that the t-value (2.21) is greater than the t-table (1.67), as well as a significant increase in the final test, where the experimental class scored 80, higher than the control class. This study concludes that the SSCS model has a positive effect on the mastery of physics concepts among class XI MIPA students of SMAN 1 Lembar.

Other research by Rosalia (2019) also shows that the SSCS model has a positive effect on students' understanding of concepts and science process skills. The average post-test score of the experimental class was 75.59, higher than the control class, which only scored 68.71. The highest indicator in the experimental class was found in the application of concepts in problem-solving (83.80), while the control class had the highest indicator in restating concepts (76.85). Hypothesis testing using Manova showed a significance value of sig <0.05, which means there is a significant difference between the experimental and control classes due to the application of different learning models.

In a study by Astutik (2019), which tested the influence of visual media in the SSCS model on the mastery of physics concepts of temperature and heat, it was found that the experimental class using the SSCS model assisted by visual media had an average post-test score of 73, higher than the control class, which obtained a score of 66. The effect size value of 0.536 indicates a fairly strong influence of this model on students' mastery of physics concepts.

Mustofa's (2015) research on the influence of the SSCS model with the mind mapping strategy on the mastery of physics concepts showed that the experimental class obtained an average post-test score of 77.9, higher than the control class, which only obtained 66.8. The t-test showed that t = 4.432 was greater than t = 1.983, indicating that students' mastery of concepts in the experimental class was better than that in the control class. The high effect size value (0.93) indicates a large influence of the application of the SSCS model combined with the mind mapping strategy on the mastery of physics concepts.

Johan's (2014) research, which focused on the SSCS model in dynamic electricity learning, also showed similar results, with an average post-test score in the experimental class of 77.9, higher than the control class, which only obtained 66.8. The t-test produced t = 4.432, which is greater than t = 1.983, and the effect size value of 0.93 shows a large impact of this model on the mastery of physics concepts.

Overall, these findings indicate that research on the application of the SSCS learning model to the understanding and mastery of physics concepts is still limited, although this model shows many advantages and positive impacts that can be applied to improve the understanding and mastery of physics concepts in learning.

CONCLUSION AND SUGGESTIONS

Based on the analysis of articles on the SSCS model and its impact on understanding and mastering physics concepts, it was concluded that the SSCS model has a positive effect on improving the ability to understand and master physics concepts at both the high school and college levels. This SSCS learning model is highly recommended for implementation and further study to enhance the understanding and mastery of physics concepts. The findings from research on the SSCS learning model, which focuses on improving understanding and mastery of physics concepts, are still limited and have primarily been conducted at the high school and college levels.

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