Review of Learning Result of The Physics Base on SSCS (Search, Solve, Create, and Share) Model in Terms of Critical Thinking Skills

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Abstract. Since 2020, the whole world has been affected by Covid 19. The impact of the Covid 19 pandemic is not only on the social sector but also on the education sector. So that education must continue to be carried out using distance learning or online. However, changes in the learning process also affect the teaching and learning conditions of students and teachers. Therefore, it is necessary to apply an appropriate learning model. One of them uses the SSCS learning model. SSCS is a learning model that can improve critical thinking skills. The SSCS model has four stages: search, problem-solving (solve), create, and share. At the search stage, students are taught to understand the problem. Next, students make a plan to solve the problem. In the next step, students build a solution from the problem-solving strategy that has been arranged in the previous stage. Finally, the solutions that have been constructed are disseminated and evaluated for continuous improvement. The purpose of this paper is to provide a comprehensive description of the development of the SSCS model, especially in physics learning that has been carried out to improve critical thinking skills. It was concluded that distance and direct knowledge using the SSCS learning model experienced an increase in abilities and scores of around 40% - 50%.

1. Introduction
At the beginning of 2020, all countries around the world experienced a COVID-19 pandemic [1]. Covid-19 stands for Coronavirus disease 19. Covid-19 is a virus that attacks the human respiratory tract. The existence of the Covid-19 pandemic has resulted in several human activities occurring. So there is a policy to implement social distancing in all activities [2]. Social distancing is also applied in the world of education, which gives rise to remote teaching.

The implementation of distance learning is a challenge for educators and students alike [3]. So it is necessary to overcome the problems that arise when remote teaching takes place. The challenges faced by educators include basic skills, teaching and learning processes, and understanding concepts.

The concept of the learning process is fundamental for students to meet [4]. Either the subjects that require an understanding of the concept in physics. Physical concepts are challenging to understand by most students. Factors that influence students' lack of mastery of physics concepts are the learning models and methods used in teaching [5].
In addition, physics is a part of science. Physics describes physical and theoretical phenomena [6], which also explains why these phenomena can occur [7]. Furthermore, physics teaches knowledge, concepts, facts, and principles and prioritizes discovery [8]. One way to apply the discovery process to learning is to use critical thinking skills. Critical thinking skills can make students understand various disciplines. This is because students can believe in cognitive terms, sort out thinking activities in real situations, and focus on solving problems in learning. This ability needs to be possessed by students because they apply various activities in education. These activities can be in processing, analyzing, synthesizing, and evaluating the information obtained to make decisions and problem-solving activities [9].

The critical thinking skills of students in Indonesia need to be honed. It is because the reasoning and thinking abilities of students are still low [10]. The way to hone critical thinking skills is to allow students to solve problems independently, and the solution is done by connecting to experience because the experience can give its meaning for students [11].

Learning that can present various abilities applies the SSCS (Search, Solve, Create and Share) model. The SSCS model was introduced by Pizzini, which requires students to expand conceptual knowledge in solving problems, applying them to everyday life, and improving critical thinking skills. The SSCS learning model has four stages. At the beginning of learning, 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 that have been provided, students perform problem solutions (Create). After that, problem-solving results are distributed and conveyed to friends and teachers (Share) [12]. Therefore, the application of SSCS learning can model involving students at each stage. So that students can be applied and more enthusiastic when learning because they are directly involved in education [13].

Education has a goal so that students gain knowledge and can think at a high level to achieve the ability to solve problems [14]. It needs to be honed so that the learning received is more meaningful. So to achieve educational goals, it is necessary to apply the SSCS (Search, Solve, Create and Share) learning model.

2. Method
The applied, systematic literature review focuses on describing and discussing topics from a theoretical and conceptual point of view [15]. The first step is to find suitable sources through Google Scholar and electronic databases related to critical thinking, distance learning, and the SSCS learning model. The next step is to read the abstract to sort out the initial articles related to the four topics. Then, design a conceptual framework to summarize the main arguments of various researchers in this field. Finally, a systematic search focused on theoretical and empirical studies to be reviewed comprehensively, which is carried out within the conceptual framework of the research.

3. Results
In this literature review, several research data are generated from various researchers. The topics used in the literature review are Critical Thinking, Application of Distance Learning, and Application of the SSCS learning model. In addition, the presentation of data is data from several interrelated researchers in a study conducted by [16] regarding the application of the SSCS learning model in mathematics subjects to emphasize mathematical concepts. The study obtained data on the differences in students' ability to solve problems between the control and experimental classes, as shown in Table 1 [16].
Table 1. ANCOVA test the difference in problem-solving between the experimental class and the control class

| Source            | Type III Sum of Squares | Df | Mean Square | F      | Sig. | Partial Eta Square |
|-------------------|-------------------------|----|-------------|--------|------|-------------------|
| Corrected Model   | 16546.879               | 2  | 8273.440    | 16.780 | 0.001 | 0.210             |
| Intercept         | 59639.549               | 1  | 59639.549   | 120.957| 0.001 | 0.490             |
| Pre-Test          | 7788.052                | 1  | 7788.052    | 15.795 | 0.001 | 0.111             |
| Group             | 7828.763                | 1  | 7828.763    | 15.878 | 0.001 | 0.112             |
| Error             | 62126.159               | 126| 493.065     | -      | -    | -                 |
| Total             | 597247.000              | 129| -           | -      | -    | -                 |
| Corrected Total   | 78673.039               | 128| -           | -      | -    | -                 |

The SSCS learning model can be applied in chemistry subjects. The implementation of SSCS learning is carried out by remote teaching or dare. The results of the research data are presented in Table 2 [17].

Table 2. Average pretest-posttest scores in the experimental class and the control class

| No  | Data Analysis | Experiment Class | Control Class |
|-----|---------------|------------------|---------------|
| 1   | Average Pretest | 41.00            | 47.00         |
| 2   | Average Postest| 76.75            | 70.50         |
| 3   | N-Gain        | 0.59             | 0.42          |

The application of the SSCS learning model can also be made in physics subjects. For example, one of the materials used is the material temperature and heat. In this material, students are taught using the SSCS learning model, which emphasizes critical thinking skills. The data obtained are the pretest and posttest results, as shown in Table 3 [18].

Table 3. Recapitulation of Pretest and Posttest

| Group                          | Pretest | Posttest |
|--------------------------------|---------|----------|
|                                | Highest | Lowest   | Highest | Lowest   |
| Experimental Group             | 35      | 0        | 75      | 53       |
| Control Group                  | 48      | 0        | 75      | 46       |
| Experimental Group average score| -      | 20,4412  | -       | 62,5588  |
| Control Group average score    | -       | 19,6765  | -       | 56,2941  |

The SSCS learning model is also used in making science textbooks. At the beginning of the study, the researcher saw a difference in the average pretest and posttest results. Then test the hypothesis using the effect size statistical test. The function of effect size is to know the magnitude of the influence of science textbooks on students' knowledge. The test results have been presented in Table 4 [19].

Table 4. Data From The Effect Size Statistics Test Result

| Cohen’s (D) | S       | Score | Category     |
|-------------|---------|-------|--------------|
| 27.96       | 14.99   | 1.86  | Great influence |

Meanwhile, in classroom action research that uses the SSCS Learning Model, learning evaluations are also carried out at the beginning and end of the meeting. Assessment at the beginning and end is helpful to find out whether the material conveyed has been understood or not. The average evaluation results in cycles I and II are presented in Table 5 [20].
Table 5. SSCS Learning Model Evaluation Test Results

| No. | Cycle   | Many students get scores ≥ 75 | Percentage of the number of students who scored ≥ 75 | Score Average |
|-----|---------|-------------------------------|--------------------------------------------------|---------------|
| 1.  | Cycle I | 26 Siswa                      | 65.00 %                                          | 73.90         |
| 2.  | Cycle II| 34 Siswa                      | 85.00 %                                          | 89.73         |

In the study of the SSCS learning model, other researchers conducted interviews with two students. This interview aims to find out that practical activities can see the science process skills of junior high school students from each different material. It is because, during practicum, students do not understand the roses of science. Because not all students like practical activities. So that the resulting skills are different science process skills, science process skills affect students' thinking ability. The analysis results regarding the thinking ability of junior high school students are presented in Table 6 [21].

Table 6. Analysis Results of the Description of Junior High School Students' Process Skills

| Theory     | Range     | Category | Mean | Median | Min | Max | % | f |
|------------|-----------|----------|------|--------|-----|-----|----|---|
| Density    | 46.00 – 80.50 | VB       | 105.4 | 87.5   | 66  | 178 | 41.4 | 24 |
|            | 80.51 – 115.00 | B        |       |        |     |     | 19  | 11 |
|            | 115.01 – 149.50 | G       |       |        |     |     | 20.7 | 12 |
|            | 149.51 – 184.00 | VG      |       |        |     |     | 19  | 11 |
| Mirror     | 46.00 – 80.50 | VB       | 138.0 | 136.5  | 99  | 175 | 39.7 | 23 |
|            | 80.51 – 115.00 | B        |       |        |     |     | 12.1 | 7  |
| Reflection | 115.01 – 149.50 | G       |       |        |     |     | 20.7 | 12 |
|            | 149.51 – 184.00 | VG      |       |        |     |     |      |    |

4. Discussion

Based on the research results from various researchers, it can be seen that the SSCS learning model can be applied in multiple subjects. Subjects that apply, especially in issues that require the application of formulas and use calculations. It can be a solution so that students are not only able to count. But also able to apply basic concepts accompanied by critical thinking skills.

Students showed that the SSCS learning model was superior to those who did not use it in problem-solving abilities. This presentation is in line with research results [17,18]. They revealed that students' problem-solving ability increased after they experienced the SSCS teaching model compared to those who did not. It is because students who use the SSCS learning model are directly involved in learning activities. In the search stage, students are presented with challenging questions about stories related to the material. The story is used so that students can convey ideas before the question and answer activity is carried out, and the problem formulation obtained can be used as a lesson starter. In the solving phase, students are involved in problem-solving by observing students learn from their experiences while finding answers to questions. Finally, in the create phase, students are instructed to conclude their solutions that come from problem-solving backgrounds, which require higher-order thinking. This process follows the statement [22] that problem-solving skills are obtained from competencies that apply knowledge based on existing situations and involve high-level thinking. At this stage, students use and develop problem-solving skills.

In the sharing phase, students convey the solutions obtained by presenting results that require interaction between the presenter and the audience. Discussion activities can strengthen the thinking power of students so that they can deepen their understanding of a problem. Discussions are also able to provide opportunities for students to exchange ideas about the solutions and materials discussed. Applying the SSCS learning model allows students to hone important skills, encouraging them to think critically, creatively, and independently. It supports the opinion [23] that students' thinking abilities influence problem-solving abilities. Therefore, the SSCS learning model helps students to solve problems through higher-order thinking skills. While in conventional learning methods, students are
relatively passive during teaching and learning activities. In this model, learning involves the teacher. As a result, students lack the initiative to be involved in discussing a topic.

Based on the discussion above, students who learn to use the SSCS learning model show an increased ability to solve problems compared to those who do not. Students who are taught using the SSCS learning model also show better self-efficacy than those who are not. Therefore, this study supports the statement [24] that students who experience the SSCS learning model have better self-efficacy than those who do not share the same thing. According to [24], the SSCS learning model can provide opportunities for students to formulate their ideas independently and teach students to find and write systematic solutions while being actively involved in the teaching and learning process and sharing ideas. They with other people.

Research results from various researchers support the use of the SSCS learning model by teachers in the classroom. The use of the SSCS learning model will affect the ability of students to solve problems and think critically. This model is recommended for use by teachers of other subjects. It is because the SSCS model and playing a role in solving problems can also hone students' critical thinking skills. In addition, the SSCS model can also be applied in learning that is carried out remotely (online).

5. Conclusion
Based on research from various researchers, it was concluded that distance and direct learning using the SSCS learning model experienced an increase in abilities and scores of around 40% - 50%. The growth can be seen from the results of the pretest and posttest done by students. The increase is because the SSCS learning model teaches students to solve problems and hone their critical thinking skills. The SSCS learning model can also be applied in various subjects such as mathematics, chemistry, and biology.

6. Acknowledgments
I would like to thank all those who have prayed for and helped the success of my paper. Mainly I thank Allah SWT, who has given me the ability. Then I thank my family, especially my father and mother, who have supported me. Finally, I don't forget to thank my supervisor, who has guided me patiently and sincerely.

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