

Development of SSCS Model Learning Tools on Digestive System Topic to Train Students' Creative Thinking Skills

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ABSTRACT

The 21st century requires students to develop various skills and knowledge. One essential skill to be fostered is creative thinking. The digestive system topic is quite complex and abstract, which results in students having difficulty understanding it. Observations at SMAN 8 Gorontalo and SMAN 1 Gorontalo Senior High School revealed that students' creative thinking skills, including fluency and originality, are still lacking and need to be trained and improved. This study aims to produce learning tools using the SSCS model for digestive system topics with valid, practical, and effective criteria. The developed learning tools include a teaching module, student worksheets, and creative thinking question sheets. The research method used was qualitative descriptive analysis and quantitative data calculation with the Borg and Gall development model. The validity analysis results showed that the teaching module scored 89% (valid category), student worksheets 92% (valid category), and the creative thinking skills test 89%. Practicality analysis results indicated that teacher activity scored an average of 95% (excellent), and student activity 92% (excellent). The effectiveness analysis of the creative thinking test showed a pre-test score of 50% and a post-test score of 88%. Student response results were 88%

(excellent). These data indicate that the learning tools developed with the SSCS model can train students' creative thinking skills.

Keywords: Learning Tools, SSCS, Creative Thinking

INTRODUCTION

The 21st century requires students to develop various skills and knowledge. According to Redhana (2019), 21st-century demands for students include critical thinking, creative thinking, problem-solving, communication, information literacy, metacognition, and collaboration skills. One essential skill to be fostered in students is creative thinking (Permendikbud, 2016). Lestari (2020) states that through creative thinking, students can identify problems that are occurring, solve them, and communicate their ideas to others.

One of the topics in biology learning for 11th-grade students that can be further developed in terms of learning tools is the digestive system. Based on observations and interviews conducted by the author with subject teachers, it was found that the digestive system topic is quite complex and abstract, leading to students' limited understanding, particularly regarding the mechanisms of the digestive system. According to Ulfa and Lia (2019), the digestive system topic encompasses various

facts that shape students' knowledge through fairly complex discussions. Additionally, the author's experience as an educator who previously conducted Practical field experience (PPL) at SMAN 1 Gorontalo Senior High School revealed an issue where students, when asked about disorders and diseases of the system based on their experiences, still needed to seek reference answers from the internet to verify their responses. This indicates that students' creative thinking fluency (smooth thinking) and originality skills are still significantly lacking and, therefore, need to be trained and enhanced. Data from TIMSS (Trends in International Mathematics and Science Study) show that Indonesia ranks 44th out of 49 countries in terms of low creative thinking skills (Mukti and Soedjoko, 2021). According to Fajri et al. (2023), the digestive system topic is one of the subjects that can foster creative thinking skills among students. Thus, teachers need to develop learning tools in line with effective teaching models to train students' creative thinking skills. Aini (2021) asserts that educators have a responsibility to design learning activities that assist students in problem-solving. One of the learning models that can train creative thinking skills is the SSCS (Search,

Solve, Create, and Share) model. The SSCS learning model is problem-solving based and focuses on student-centered processes. According to Lele and Dyah (2022), there are four stages in the SSCS learning model: the search stage, where students are directed to investigate a problem; the solving stage, where students discuss with group members to solve previously obtained problems; the create stage, where students can develop solutions to these problems in the form of products or creative ideas; and the sharing stage, which is the final stage requiring students to present the results of group discussions to other group members. Widayati and Hani (2020) state that the SSCS learning model can guide students to articulate, connect, and analyze a problem until reaching the problem-solving stage, thus enabling students to engage in group discussions actively.

METHODS

The method employed was quantitative descriptive, with the Borg and Gall development model adapted to the study's needs. The study was conducted from January to February 2024. The research development process following Borg and Gall's procedure was outlined as follows:

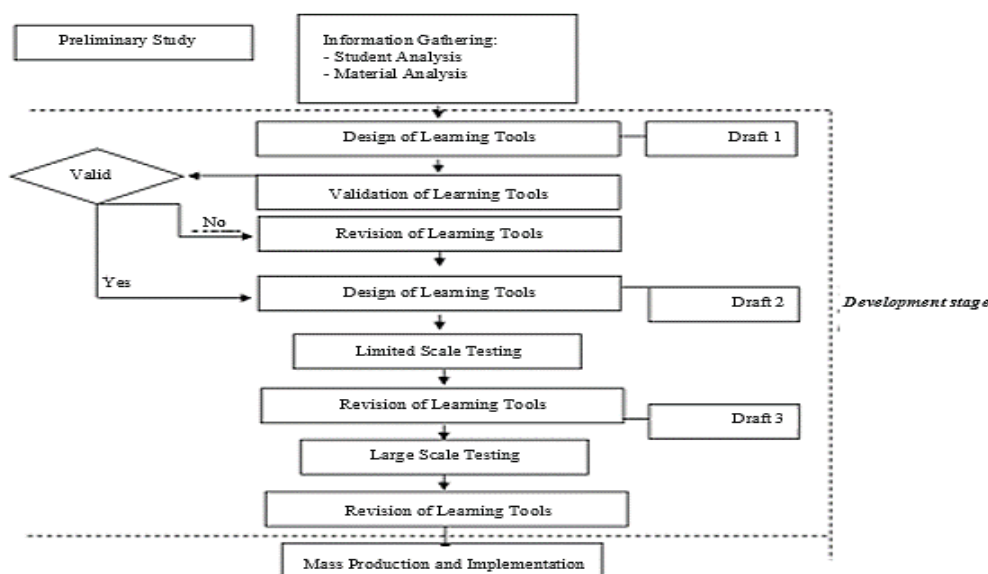


Figure 1. Borg and Gall Development Model (1983)

The study was conducted at SMA 1 Gorontalo Senior High School, grade XI-4, with a total of 32 students. Data analysis included validation testing of the learning tools, practicality testing, and effectiveness testing.

Validation testing was conducted by two expert lecturers and one biology subject teacher. Practicality testing was assessed based on several indicators, such as student

activities and teacher activities. Effectiveness testing was evaluated based on several indicators, including the results of the student's creative thinking skills test, the t-table test results for creative thinking skills, N-Gain analysis, and student responses. The validation, practicality, and effectiveness criteria tables can be seen in the table.

Table 1. Product Validation Criteria

No.	Validity Criteria	Validity Level
1.	90,00% - 100,00%	Very valid, can be used without revision
2.	76,00% - 89,00%	Valid, can be used with minor revisions
3.	65,00% - 74,00%	Fairly valid, and can be used with major revisions
4.	40,00% - 64,00%	Less valid, recommended not to be used due to the need for major revisions
5.	00,00% - 39,00%	Not valid, cannot be used

Table 2. Practicality Criteria

Criteria	Score (%)
Very Poor	0 – 20
Poor	21 – 40
Fair	41 – 60
Good	61 – 80
Very Good	81 – 100

Table 3. Effectiveness Criteria

N-Gain Score	Gain Normalization Criteria
$0.70 < N\text{-Gain}$	High
$0,3 < N\text{-Gain} < 0.70$	Medium
$N\text{-Gain} < 0.30$	Low

RESULT

Validation Test Results

Validity of Teaching Module

Table 4. Teaching Module Validation Results

Validator	Score	Criteria
Expert Lecturer 1	95%	Very valid
Expert Lecturer 2	94%	Very valid
Biology Subject Teacher	89%	Valid

Based on Table 4, the teaching module developed obtained a validity score of 95% from validator 1, 94% from validator 2, and 89% from validator 3. The scores from all three validators included in the "very valid" criteria (90% - 100%) based on the validation assessment criteria.

Validity of Student Worksheet

Table 5. Validation Results for Student Worksheet

Validator	Score	Criteria
Expert Lecturer 1	91%	Very valid
Expert Lecturer 2	91%	Very valid
Biology Subject Teacher	93%	Very valid
Average	92%	Very valid

Based on Table 5, the student worksheet that has been prepared obtained validity ratings from validator 1 with a score of 91%, validator 2 with a score of 91%, and validator 3 with a score of 93%. The average score obtained from these three validators reaches 92%, which is on the criteria of highly valid (score 90% - 100%).

Validity of the creative thinking test sheet

Table 6. Creative Thinking Test Results

Validator	Score	Criteria
Expert Lecturer 1	90%	Very valid
Expert Lecturer 2	90%	Very valid
Biology Subject Teacher	86%	Very valid
Average	89%	Valid

Based on Table 6, the pre-test and post-test question sheets that have been prepared obtained validity ratings from validator 1 with a score of 90%, validator 2 with a score of 90%, and validator 3 with a score of 86%. The average score obtained from these three validators reaches 89%, which includes the Valid criteria (score 76% -

89%) based on the validation assessment criteria.

Practicality Test Results Results of teacher activity analysis

Table 7. Analysis of Teacher Activities in Grades XI-4

No	Observed Aspects	Observer		Average	Criteria
		1	2		
1	Introduction	100%	100%	100%	Excellent
2	Main Activities	91%	91%	91%	Excellent
3	Conclusion	100%	100%	100%	Excellent
Average		95%	95%	95%	Excellent

Based on Table 7, the analysis of observers on teacher activities in grades XI-4 at SMA 1 Senior High School obtained an average score of 95% with excellent criteria.

Results of Student Activity Analysis

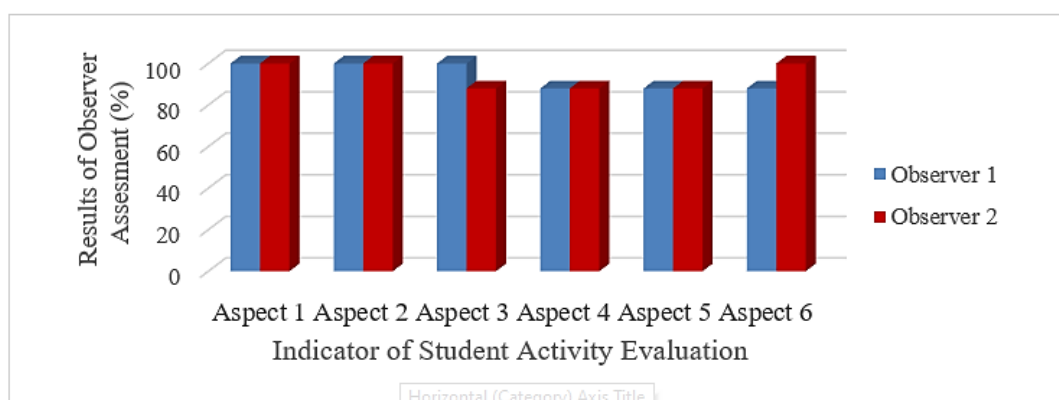


Figure 2. Results of Observer Analysis in Grade XI-4 SMA 1 Gorontalo Senior High School

Based on the data shown in Figure 2, the assessment results of observers on student activities overall reached an average of 92% for all aspects evaluated, with excellent criteria.

Effectiveness Test Results

Results of the creative thinking test

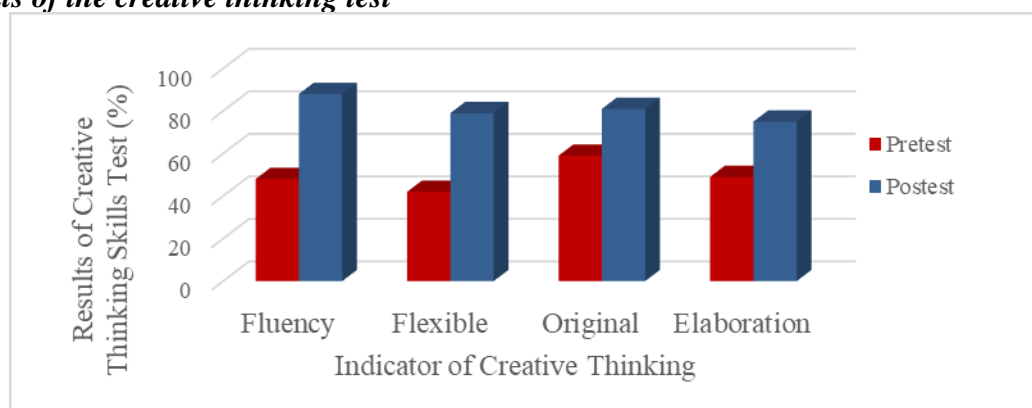


Figure 3. Results of Creative Thinking Skills Test in the Luas Test for Grade XI-4 at SMAN 1 Gorontalo Senior High School

Based on Figure 3, it is evident that students' creative thinking skills during the pre-test obtained an average score of 50%. The post-test score obtained an average of 81%.

Student Responses

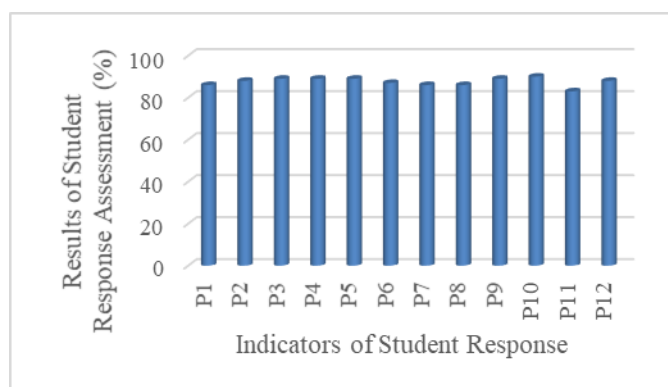


Figure 4. Results of Analysis of Student Responses in Grade XI-4 at SMA 1 Gorontalo Senior High School

Based on Figure 4, it indicates the results of the test of student responses to each aspect of the questions. The average score of the test results of student responses obtained a score of 88%, achieving the excellent criteria.

N-Gain Analysis

Table 8. N-Gain Analysis Results

Indicator of Creative Thinking Skills	Average Pre-test Score	Average Post-test Score	N-Gain Score	Category
Fluency	48	88	0,7	High
Flexible	41	79	0,6	Medium
Original	59	81	0,5	Medium
Elaboration	50	75	0,5	Medium
Average	50	84	0,6	Medium

The average calculated based on the formula adapted from (Mustofa et al., 2021) indicates that the student's learning outcomes included in the high category with attainment of 0.60 or $0.3 \leq g \leq 0.7$.

DISCUSSION

The validation results of the learning tools, in the form of modules validated by 3 expert validators, obtained an average score of 92% with highly valid criteria. The validation results of the student activity worksheet also obtained an average score of 92% with highly valid criteria. Meanwhile, the validation results of the creative thinking questions obtained an average score of 89% with valid criteria. According to Mustofa et al. (2021), the validation criteria for a product used in learning, with an achievement of 90%-100%, include highly

valid criteria and can be used with minor revisions.

The practicality test results in grade XI-4 obtained an average score of 92% with excellent criteria. This data indicates that students actively engaged in discussions, as evidenced by the equal distribution of roles for each group member in solving the problems presented in the student worksheets This aligns with the opinion of Widyawati and Hani (2020) that the SSCS model influences increasing student activity in the classroom learning process. Consistent with the study by Fatiya et al. (2019), the implementation of the SSCS learning model, particularly in the solve and share stages, can further improve student activity because the solving stage supports students to discuss with their group members, while for the sharing stage,

students can communicate the results of their discussion to other groups through expressing opinions, asking questions, providing suggestions, and giving feedback on a problem between groups.

The analysis by observers regarding teacher activities in grades XI-4 obtained an average score of 95% with excellent criteria. However, improvement is needed in some other aspects to maximize the learning process further, such as aspects of core activities that require the teacher to guide each group to achieve the learning objectives. According to Amalia et al. (2020), learning objectives can be achieved if teachers can organize and manage the class to create learning conditions that help students learn effectively. Additionally, according to Damung et al. (2019), one of the characteristics of good classroom management is active interaction between teachers and students, thus creating motivation for students to participate actively in class.

Based on the analysis of creative thinking skills conducted in grades XI-4 at SMAN 1 Gorontalo Senior High School, the aspect of fluency (smooth thinking) experienced a significant increase compared to other creative thinking indicators, with an average score of 48% (pre-test) rising to 88% (post-test). This is consistent with the research by Fajri et al. (2023), which states that the highest percentage of creative thinking lies in the aspect of fluency. The average score in the flexible thinking indicator was 42% (pre-test) and 79% (post-test). This indicates that students can solve problems with various solutions. Research by Mukti and Soedjoko (2021) states that students can meet the flexible thinking indicator if they can provide alternative solutions to a problem in different ways. In the original thinking indicator, the average score was 59% (pre-test) and 81% (post-test). According to Fajri et al. (2023), the original thinking indicator can be fulfilled if students can provide answers different from their peers. In the elaboration thinking indicator, the scores were 50% (pre-test) and 75%

(post-test). If students can think in elaboration, it can help them build long-term memory (Fajri et al., 2023).

The analysis of student responses in grades XI-4 obtained an average score of 88% with excellent criteria. This indicates that students have a positive response to the learning tools with the SSCS model to train creative thinking skills in the digestive system topic. This aligns with the statement that aspect 10 (Questions provided are relevant to the topic being learned) obtained the highest score in the class average, at 90%. According to Lele and Diyah (2022), the SSCS learning model is suitable for teaching the digestive system topic. Additionally, another opinion from Rahmatika et al. (2014) states that the use of the SSCS learning model can help students think creatively.

Based on the N-Gain analysis, it is evident that the learning tool created using the SSCS model is quite effective for training students' creative thinking skills. This is in line with the opinion of Khairunnisa and Rizki (2023) that the SSCS learning model can be used to improve students' creative thinking skills. This opinion is also supported by Aini's research (2021), indicating that the SSCS learning model can encourage students to collaborate in problem-solving.

CONCLUSION

The SSCS (Search, Solve, Create, and Share) learning tool product that has been developed meets the criteria for suitability for use in the learning process with a highly valid category. Based on the practical analysis of the learning tool product obtained from the implementation results by teachers and students, it is evident that the SSCS learning tool model is highly effective for use in grades XI-4 at SMA 1 Gorontalo. Based on the scores of the creative thinking skills test, N-Gain analysis, and student responses, the developed learning tool product can train and foster students' creative thinking skills.

Declaration by Authors

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