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Development of a Science Teaching Module Based on SSCS in The Living Things Classification Concept

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Abstract: A teaching module is a learning tool or design based on a curriculum applied to achieve predetermined competency standards. This research aims to use the ADDIE development model to produce a science teaching module based on search, solve, crate and share (SSCS) on valid, practical and effective living things classification concepts. This research was conducted at SMP Negeri 1 Molibagu involving 24 students in Class VII C. The study showed that the results of validating the Science Teaching Module (STM) based on SSCS from experts achieved a score of 90%, which was included in the very valid category and suitable for use in learning. The practicality of the STM based on SSCS as shown by the implementation of learning during two meetings with a percentage of 93% and included in the very good category, student response reached 81.2% with very good criteria, and student activity with a percentage of 85.5% with good criteria. The effectiveness of the STM based on SSCS is shown by the results of the analysis of learning outcomes tests by obtaining N-Gain values 0.78 with high criteria. Thus, it is concluded that the concept of STM based on SSCS in the living things classification concept has valid, practical, and effective criteria. The research of STM based on SSCS is expected to be developed in other material concepts.

Keywords: Living Things Classification; Science Teaching Module; SSCS.

Introduction

Education is an inseparable part of humans, from birth to death. National education aims to cultivate skills and shape the character and civilization of a dignified society, ultimately enhancing the nation's intellectual life [1]. Education aims to nurture students' potential, enabling them to become individuals who are faithful and devoted to God Almighty, possess noble character, maintain good health, are knowledgeable, capable, creative, independent, and grow into democratic and responsible citizens [2-3].

Learning is an activity the teacher facilitates to enable students to acquire knowledge, develop skills and habits, and form positive attitudes and self-confidence. Learning is a process to help students learn well. In the educational context, Teachers instruct students to help them learn and master lesson content, achieve a specified objective (cognitive objectives), and influence changes in attitudes (affective aspect) and skills (psychomotor aspect). Teachers teach based on the curriculum, and the teaching process may involve solely the teacher's efforts. In contrast, learning emphasizes the interaction between teachers and students [4-6].

The educational curriculum currently implemented is the independent learning curriculum, which is closely related to mastery of technology. The independent learning curriculum is guided by four principles that have been transformed into new policy directions, namely: The National Standart School Exams has been replaced with an assessment exam to evaluate student competency through written tests or other comprehensive assessments like assignments, The National Examination has been replaced with a minimum competency assessment and character survey. This change aims to encourage teachers and schools to improve the quality of learning, while tests for student progression to the next level should not be used as a primary reference. Next, a minimum competency assessment is needed to assess literacy, numeracy, and character. In contrast to the previous curriculum, where the lesson plan followed a standard format, the independent curriculum allows teachers to choose, create, use, and develop their lesson plan formats. The three core components in making a lesson plan need to be considered: Learning objectives, activities, and assessments are now encompassed in what is now referred to as a teaching module, formerly known as the lesson plan [7-9].

Science teaching modules (STM) are learning tools or designs based on a curriculum applied to achieve predetermined competency standards. STM have a central role in supporting teachers in designing learning. The teacher plays an essential role in preparing learning tools. Teachers define their cognitive abilities to create innovative teaching modules. Therefore, creating teaching modules is a teacher's pedagogical competency that needs to be developed. This is so that the teacher's teaching techniques are more effective and efficient, and the discussion is

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within the discussion of achievement indicators [10-12]. Science learning must be adequate so that students master the subject well. Therefore, teaching modules is a solution for students' effectiveness in mastering the material. Teaching modules are more effective when appropriate learning models are used. So, in this case, the SSCS learning model was chosen. It uses a problem-solving approach that can improve students' understanding of concepts [13-14].

The results of the first observation at SMP Negeri 1 Molibagu, the new STM, will be used in 2022. It will be used for students in classes VII and VIII. The use of this teaching module still needs to improve in adapting to the student learning system. Learning models still need to be more effective, and it is still challenging to determine which model to use. The SSCS learning model has never been used since implementing the SMP Negeri 1 Molibagu teaching module. Therefore, the SSCS learning model is needed to support the use of teaching modules. This is considered necessary to overcome students' difficulties in understanding material. In class VII, one of the materials that students at SMP Negeri 1 Molibagu need help understanding is the classification of living things, where students need help to distinguish between types of living things. Judging from the number of students completing, it is still below 75%.

Research conducted by Milama et al. (2017) states that the SSCS learning model aims to expand students' knowledge by solving their problems [15]. Research conducted by Satriawan (2017) shows that the SSCS learning model has appropriate characteristics for solving learning achievement problems, developing mathematical reasoning, and growing student motivation [16-19].

Research conducted by Febriyanti et al. (2014) shows that the advantage of the SSCS model is that it can invite students to be active in learning activities by making direct observations to achieve cognitive, affective and psychomotor creativity skills [20]. Therefore, there is a great need for the SSCS learning model to develop STM. Based on the description, the author raises about developing an STM based on SSCS for the living things classification concept for students at SMP Negeri 1 Molibagu. This research can guide science teachers in determining appropriate learning models for using teaching modules in science learning.

Research Methods

The method and approach used in this research is the Analysis, Design, Development, Implementation, and Evaluation (ADDIE) method. The flow chart of the research is shown in Figure 1. This method was chosen because the stages of the ADDIE model describe a systematic approach to instructional development. This research was conducted at SMP Negeri 1 Molibagu, South Bolaang Mongondow Regency, North Sulawesi Province, with 24 students in class VII C.

Figure 1. Flow chart of research

The research method used in this development refers to the ADDIE model. It is a general learning design with an organized process of developing various materials that can be applied to traditional and online learning (face-to-face in class). However, this research is limited to the development stage.

The research instruments required are validation sheets, learning implementation sheets, student activity observation sheets, student response questionnaires, and pre-test and post-test questions. Data analysis techniques consist of analysis of validity data, data on the practicality of learning devices, and effectiveness. Analysis of Data on the Practicality of Learning Devices is determined using analysis of student responses in equation (1), Analysis of learning implementation in equation (2), and Analysis of student activities in equation (3). Meanwhile, effectiveness analysis was performed using the N-Gain test in equation (4). Note: pa is a student activity, A is the number of scores obtained, and N is the maximum score [21].

$$(\%) = \frac{\text{Number of responses}}{\text{Number of student}} \text{ X } 100\% \quad (1)$$

$$(\%) = \frac{\text{Many steps have been taken}}{\text{There are many steps to plan}} \text{X } 100\% \quad (2)$$

$$(\%)\ \text{pa} = \frac{\text{A}}{\text{N}} \text{ X } 100\% \quad (3)$$

$$\text{g} = \frac{\text{Posttest Score} - \text{Pretest Score}}{100 - \text{Pretest Score}} \quad (4)$$

Results and Discussion

The results of the development of an STM based on SSCS in the concept of living things classification can be seen in Figure 2.

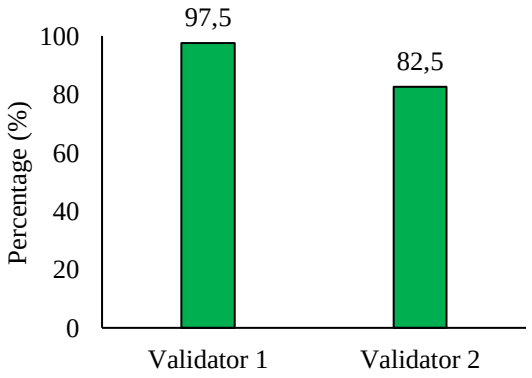

Figure 2. Teaching Module Validation

Figure 2 illustrates the validity test results, where validator 1 assigned a value of 97.5% and validator 2 assigned a value of 82.5%. The results of the average validation percentage with a value of 90% are included in the very valid category [22][23]. The assessment results by

these two validators show that the STM based on SSCS developed is good and can be used with a few revisions.

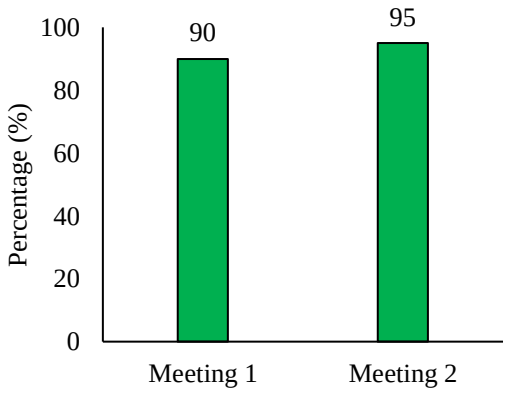

Figure 3. Learning Implementation

The results of learning implementation can be seen in Figure 3, showing that the results of learning implementation at the first meeting obtained a score of 90%, and at the second meeting, a score of 95% was obtained.

Figure 3 explains learning implementation during two meetings with 24 class VIII C students. Based on the data, the average percentage of learning implementation results for meeting 1 and meeting 2, with a score of 93%, are included in the "Very Good" category [24][25]. Based on these criteria, learning with the teaching module developed is classified as very practical.

Next, the percentage of responses is shown in the Table 1. The score result of 81.2% indicates "Good" criteria. Based on Table 1, in this broadest trial, it can also be seen that in the first indicator, the response of the majority of students (95.1%) stated that learning using STM based on SSCS made students concentrate on learning attractive, innovative, practical and suitable for vibration, wave and sound materials application. In the second indicator, most students' responses (96.5%) stated that using STM based on SSCS in learning fosters students' curiosity and enthusiasm and makes it easy to understand the material and conduct experiments. In the third indicator, most students' responses (96.4%) stated that using STM based on SSCS could improve student learning outcomes.

Table 1. Data on the Percentage of Limited Trial Student Responses

Indicators	Category (%)			
	Strongly disagree	Disagree	Agree	Strongly agree
Students' opinions about using STM based on SSCS in face-to-face learning	0.0	4.9	68.9	26.2
Effectiveness of using STM based on SSCS	0.0	3.3	60.9	35.8
Student learning outcomes after participating in learning using STM based on SSCS	0.0	3.2	70.8	26
Average percentage (%) of Student Responses				81.2

The percentage of student activity is shown in Figure 4.

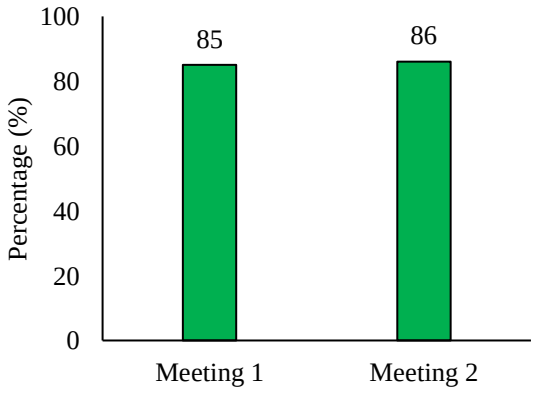

Figure 4. Student Activity Percentage

Figure 4 shows the percentage of student activity. This activity uses two observers during meetings with 24 class VIII C students. Figure 4 illustrates that the results of student activity at the first meeting obtained a score of 85%; at the second meeting, 86% was obtained. The results of the average percentage of student activity for meeting 1 and meeting 2, with a score of 85.5%, are in the "Good" category, so it can be concluded that the STM developed is effective [26][27]—the result of Student Activity Data Analysis in limited trials in Tabel 2.

Table 2. N-Gain Analysis in Limited Trials

Respondent	Pre-test score	Post-test score	N-Gain score	Category
24	31.86	85.05	0.78	High

Table 2 shows that the average individual pre-test score for class VIII C in this limited trial was 31.86. Meanwhile, the average post-test score obtained by individuals for class VIII C was 85.05. These results show that the average learning outcomes in the knowledge aspect increased after teaching and learning activities were carried out with the developed STM based on SSCS [28][29]. Class VIII C rose from 31.86 to 85.05. The N-Gain from the pre-test and post-test results is 0.78 and is included in the "High" category.

Conclusion

The validity of the STM based on SSCS in the living things classification concept at SMP Negeri 1 Molibagu resulted in the validation of the teaching module being 90% with very valid criteria. The assessment of learning implementation resulted in a very good category of 93%,

the results of student responses obtained a score for each aspect with a score range of 81.2% in the good category, and the student activity assessment score obtained a good score of 85.5%. Meanwhile, the assessment of learning test results carried out before learning (pre-test) and after learning (post-test) had an N-Gain value of 0.78 in the high category, included in the Effective criteria.

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