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The Needs of High Order Thinking Skills-Oriented Student Worksheets on The Human Circulation System Materials For Grade XI Students

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ABSTRAK

Kurikulum 2013 dirancang untuk menghasilkan generasi yang siap dan mampu menghadapi tantangan abad ke-21. Tantangan abad ke-21 menuntut sumber daya manusia yang berkualitas dan berkompeten. Kurikulum 2013 menuntut peserta didik untuk mampu berpikir tingkat tinggi (High Order Thinking Skills). Berdasarkan hasil observasi ditemukan fakta bahwa belum tersedianya media pembelajaran yang dapat meningkatkan keterampilan berpikir tingkat tinggi peserta didik. Oleh karena itu, dilakukan pengembangan Lembar Kerja Peserta Didik berorientasi HOTS tentang materi sistem sirkulasi pada tubuh manusia. Penelitian ini bertujuan untuk menganalisis kebutuhan Lembar Kerja Peserta Didik berorientasi High Order Thinking Skills tentang materi sistem sirkulasi pada tubuh manusia untuk peserta didik kelas XI SMA. Studi dilakukan dengan metode survei menggunakan angket yang disebarkan kepada peserta didik dan guru biologi. Studi dilakukan dengan metode survei menggunakan angket yang disebarkan kepada peserta didik dan guru biologi. Angket diisi oleh 63 peserta didik kelas XI MIPA dan satu orang guru biologi. Hasil angket menunjukkan bahwa peserta didik mengalami kesulitan dalam mempelajari materi sistem sirkulasi pada tubuh manusia dikarenakan materi ini terdapat banyak istilah-istilah yang membingungkan dan materinya bersifat hafalan. Peserta didik setuju bahwa penggunaan LKPD saat pembelajaran dapat membantu peserta didik dalam belajar. Pengembangan LKPD berorientasi HOTS dapat menjadi solusi dari permasalahn yang dihadapi oleh peserta didik pada materi sistem sirkulasi pada tubuh manusia.

ABSTRACT

The 2013 curriculum is designed to produce a generation that is ready and able to face the challenges of the 21st century. The challenges of the 21st-century demand qualified and competent human resources. The 2013 curriculum requires students to be able to think at a high level (High Order Thinking Skills). Based on the results of observations found the fact that there are no learning media that can improve students' higher-order thinking skills. Therefore, a HOTS-oriented Student Worksheet was developed on the material of the circulation system in the human body. This study aims to analyze the need for High Order Thinking Skills-oriented Student Worksheets about the material for the circulation system in the human body for students of class XI SMA. The study was conducted using a survey method using a questionnaire distributed to students and biology teachers. The study was conducted using a survey method using a questionnaire distributed to students and biology teachers. The questionnaire was filled out by 63 students of class XI MIPA and one biology teacher. The questionnaire results show that students have difficulty studying the material for the circulatory system in the human body because this material contains many confusing terms, and the material is rote. Students agree that the use of student worksheets when learning can help students in learning. The development of HOTS-oriented worksheets can be a solution to the problems faced by students in the material of the circulatory system in the human body.

1. INTRODUCTION

The curriculum is a set of plans and arrangements regarding the objectives, content, learning materials, and methods used to implement learning activities to achieve educational goals (Kurniaman &

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Noviana, 2019; Raditya & Iskandar, 2020). The curriculum used today is the 2013 curriculum. The teacher's task in implementing the 2013 curriculum is to change the view of teacher-centered learning to become student-centered (Nufus et al., 2017; Rini, 2015). The 2013 curriculum is designed for students who are ready and able to face the challenges of the 21st century. The current 2013 curriculum uses a 21st-century learning framework (Fernandes, 2019: 71). The challenges of the 21st century require students to be able to think at a high level (High Order Thinking Skills) (Kwangmuang et al., 2021; Laswadi, 2016; Yustitia & Juniarso, 2018). Higher order thinking skills are thinking skills that not only require memory skills but also require other higher skills (Anwar et al., 2020; Yustitia & Juniarso, 2018).

HOTS is a higher-order thinking skill that includes the cognitive domain (knowledge) as an analysis which is the ability to think in specifying aspects/elements of a particular context (Andoko, 2020; Anggraeni et al., 2021). Evaluation is the ability to make decisions based on facts/information, and creating is the ability to think in building ideas (Dwijayanti, 2021; S. Rahayu et al., 2021). Higher order thinking skills require students to solve problems critically and creatively and determine a choice made by students to achieve learning objectives. The problem is a new situation that will be solved with the knowledge and experience that students already have (Kusuma et al., 2017; Umami et al., 2021). Problem-solving is influential in training students to think higher order (HOTS). Based on the results of a questionnaire distributed to 63 eleventh-grade students of SMAN 4 Padang, it was revealed that 61.7% of students stated that the material of the circulatory system in the human body is difficult to understand. This is because the material of the circulatory system in the human body contains many confusing terms, and this material is rote.

For solutions that are carried out to facilitate students in training higher-order thinking skills and create an active learning process, it is necessary to pay attention to the learning media used. One of the learning media that can be used is the Student Worksheet. Student Worksheets are teaching materials that are packaged in such a way that students can study the material independently so that students are more active in solving existing problems through group discussion activities, practicum, and activities to answer problems related to everyday life (Kesumawati et al., 2022; Nurliawaty et al., 2017; D. Rahayu & Budiyono, 2018). Student Worksheet is a learning media that contains a summary of the material and instructions for implementing learning that must be done by students, which refers to the basic competencies achieved (Aditama et al., 2019; Dewi & Agustika, 2022).

Previous findings state that using learning media such as Student Worksheets is an alternative to improve student learning outcomes (Fauzi et al., 2021; Hamidah et al., 2018). Using Student Worksheets in the learning process makes the teacher a facilitator who is responsible for monitoring the work of students (Putra et al., 2021; Riyani & Wulandari, 2022). It causes learning to be student-centered and makes students more active in learning. Student Worksheets help students find a concept, as a learning guide for students to create independent learning activities with teacher guidance and increase students' understanding of a material concept (Aditama et al., 2019; Apriliyani & Mulyatna, 2021). One learning media that can be used is the Student Worksheet oriented to High Order Thinking Skills (HOTS). The advantages of the HOTS-oriented Student Worksheet, when compared to other Student Worksheets, are that the HOTS-oriented Student Worksheet is more concerned with creative thinking skills and critical thinking in solving problems. This study aims to analyze the need for High Order Thinking Skills-oriented Student Worksheets on the material of the circulatory system in the human body for eleventh-grade high school students. The results of this study are expected to provide initial information about learning media that need to be developed and the difficulties experienced by students in understanding the material of the circulatory system in the human body, and also the results of this study are used to develop learning media for HOTS-oriented Student Worksheets for further research.

2. METHOD

This research is qualitative descriptive research with a survey technique. The research subjects consisted of 63 students of class XI MIPA and one biology teacher at SMAN 4 Padang, conducted on February 16, 2021. This study was conducted from December 2020-August 2021. The instrument used in this study was a questionnaire on student responses to HOTS-oriented Student Worksheets about the material of the circulatory system in the human body and Student Worksheets used by teachers in learning. Data collection was carried out by distributing questionnaires to students and biology teachers via google form and the results of the analysis of the Student Worksheet used by the teacher in learning.

3. RESULT AND DISCUSSION

Result

Based on the observations made at SMAN 4 Padang obtained data as shown in Table 1.

Table 1. The results of observations of students in class XI MIPA at SMAN 4 Padang

No.	Observation Results
1.	Students find it difficult to understand the material of the circulatory system in the human body.
2.	The difficulties experienced by students are caused by the material of the circulatory system in the human body, there are many confusing terms, and the material is rote.
3.	Students agree that using Student Worksheets during learning can help in learning.

The data from the questionnaire distributed to students related to the difficulties experienced by students in studying the material for the circulatory system in the human body is shown in Table 2.

Table 2. Difficulties of students in the material of the circulatory system in the human body

No.	Difficulty in the material of the circulatory system in the human body	Total (%)
1.	Too much material	42,6%
2.	Material is rote	60,7%
3.	Lots of confusing terms	67,2%
4.	Lack of good learning media	19,7%

Based on observations made to students at SMAN 4 Padang on February 16, 2021, it was found that 61.7% of students had difficulty understanding the material of the circulatory system in the human body. The difficulties experienced by students are due to the material of the circulatory system in the human body, there are many confusing terms, and the material is rote. The learning media used in learning biology in the eleventh grade are videos, printed books, power points, modules, and Student Worksheets. The Student Worksheet used by the teacher does not refer to levels C4, C5, and C6 according to the level of the Revised Bloom Taxonomy and the demands of the 2013 Curriculum to face the challenges of the 21st century. The Student Worksheet used by the teacher prioritizes the understanding ability of the students.

Based on the student observation questionnaire analysis results, as many as 92% of students agree that using Student Worksheets can help to learn. 8% of students do not agree that using Student Worksheets can help learning. The material for the circulation system in the human body is contained in Basic Competency 3.6, which analyzes the relationship between the structure of the tissues making up the organs in the circulatory system, bioprocesses, and functional disturbances that can occur in the circulatory system in the human body. This material has led to the Revised Bloom's Taxonomy level following the 2013 Curriculum to face the challenges of the 21st century.

Discussion

Based on the results of the analysis of the Student Worksheet used by the teacher, the HOTS-oriented Student Worksheet can be a solution to the problems faced. HOTS-oriented Student Worksheets can be used as learning media to train students' higher-order thinking skills. The advantages of the HOTS-oriented Student Worksheet can help students achieve learning goals. In addition, using HOTS-oriented Student Worksheets can improve students' higher-order thinking to face their problems. The HOTS-oriented Student Worksheet is more concerned with critical and creative thinking skills in solving problems. The existence of the Higher Order Thinking Skills-oriented Student Worksheet aims to improve students' understanding of the Higher Order Thinking Skills questions developed so that students can think more creatively and critically (Aditama et al., 2019; Muzayyanah et al., 2020).

Higher Order Thinking Skills ask students to evaluate information, draw conclusions, and make generalizations critically. Students will also produce original forms of communication, make predictions, suggest solutions, create and solve problems related to everyday life, express opinions, and make choices and decisions (Jarvis & Baloyi, 2020; Mustika & Susanti, 2020; Roets & Jeanette Maritz, 2017). The Higher Order Thinking Skills questions developed on this Student Worksheet can help students train to think creatively and critically. The Higher Order Thinking Skills-oriented Student Worksheet is presented as attractively as possible with Higher Order Thinking Skills activities and questions that can help students think critically and creatively. The selection of illustrations, designs, colors, images, and layouts is made as attractive as possible, according to the needs of students and following the characteristics of indicators of

understanding students' mathematical concepts (Mustika & Susanti, 2020; Utomo et al., 2019). This finding is reinforced by previous findings, which stated that HOTS-based worksheets effectively improved students' critical thinking skills (Noprinda & Soleh, 2019; S. Rahayu et al., 2021). Student Worksheets can be declared suitable for use by students (Idayanti & Sujana, 2022; Makhrus et al., 2018; Widodo, 2017). This research implies that teachers can create HOTS-based Student Worksheets to improve students' critical thinking skills.

4. CONCLUSION

The results showed that the material for the human circulation system is difficult for students to understand, so it requires learning media that can help students in learning. The Student Worksheet used by the teacher does not refer to the Revised Bloom Taxonomy level following the 2013 Curriculum and prioritizes student understanding. The learning media that will be developed on the material of the circulation system in the human body for eleventh-grade high school students is the HOTS-oriented Student Worksheet which can train students' higher-order thinking skills and be able to face the challenges of the 21st century following the 2013 Curriculum.

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