



## Biology teaching material needs analysis based on cooperative learning approaches in the human physiology system



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### ABSTRACT

This research was conducted because of the low development of teaching material made by educators. The development of a teaching material that is by the character and background of students is necessary to be able to facilitate students in the learning process. This study aims to obtain preliminary data to develop a teaching material based on a cooperative approach to the material system of human physiology. This research is a qualitative descriptive study. The population used is high school students in Malang with 75 research samples taken from three schools. Random sample selection by giving an open questionnaire. Data collection techniques were carried out by observation, questionnaire distribution, and interviews. The data obtained were analyzed through descriptive analysis. From the results obtained from the needs analysis test, 98% of students expect the development of a teaching material that can help students understand the topic of the human physiology system by developing teaching materials based on a cooperative approach.

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### INTRODUCTION

The creativity and innovation of educators in implementing learning today is a must. Educator innovation is needed in the learning process to produce an enjoyable learning process (Yunani, 2009). Thus educators must be creative and able to innovate in implementing the learning process so students can be interested and follow the learning process well. Creativity and innovation of an educator can develop from the aspect of sharing, one of which is the creativity of educators in developing teaching materials or learning resources.



Teaching material is one source of learning that contains both specific and general (Mulyasa, 2006; Prastowo, 2012; Ardiansyah, Corebima, & Rohman, 2016; and Irawati & Saifuddin, 2018) explained that teaching materials are a crucial component in helping the learning process run smoothly and following learning objectives. Teaching materials are learning resources that are easy to find and use, which contain text and images that make it easy for students to read and understand them (Abdias, Duda, Utami, & Bahri, 2019). The availability of teaching materials is crucial because in the absence of a teaching material educators will experience difficulties in the learning process. It is undeniable that until now both lecturers and teachers have not developed much teaching material, besides that the availability of teaching materials is also very minimal and inadequate for use. Arsanti (2018) and Abdias et al. (2019) explained that teaching materials at the moment are quite limited and not sufficient to be used in the learning process. Most educators only utilize teaching materials in the form of books published by existing publishers. Educators should use teaching materials that are following the conditions and character of their students so that these teaching materials can be put to good use by their students. Perwitasari, Wahjoedi, & Akbar (2018) explained that the development of teaching materials must modify to the environmental conditions of the learners and to preserve the relationship of various events as a whole.

Teaching materials developed by educators must still follow the rules for preparing teaching materials. Pusat Kurikulum & Perbukuan (2012) states that the criteria for the preparation and evaluation of perfect teaching materials meet at least four conditions, namely 1) Scope of theory by the curriculum, 2) Presentation of theory meets the principles of learning, 3) Language and right readability, and 4) book format that attracts students. Thus the development of teaching materials is a necessity by requiring creativity and innovation from educators to produce appropriate and absorbing teaching material. One way to develop such teaching materials is by combining an approach, model, or learning strategy.

The cooperative approach is one of the learning approaches that is deemed suitable for use in developing teaching materials. A Cooperative approach is an approach that focuses on cooperation between individuals. Suharto (2009) and Fiteriani & Suarni (2016) explain that collaboration is a hallmark of the Cooperative approach. A cooperative approach is used for learning models. A Cooperative approach provides full opportunities for students to develop their knowledge through collaboration between groups in achieving the expected learning goals (Suharto, 2009).

The subject of biology, especially on human physiology material related to the physiology and anatomy system, is one of the topics that require a learning resource that can help in visualizing and understanding it. At the high school level, this material is taught in classes XI and XII. Generally, teaching materials available for this material are only theoretical and conceptual, of course, such teaching material can be said to be boring. Wahono, Lestari, & Gofur, (2013) explain that theoretical and conceptual teaching materials tend to cause boredom for students and students. Therefore, from the advantages of the cooperative approach that is owned, it is expected that the development of teaching materials based on a Cooperative approach can produce an appropriate teaching material and help students understand the topic, and provide broad opportunities to develop their abilities. Based on this explanation, researchers will be interested in developing teaching materials in the form of modules based on learning models that refer to a cooperative approach to human physiology system material.

## RESEARCH METHODS

### Research Design

Qualitative descriptive is a type of research carried out to uncover the issues or phenomena observed mainly about the need for developing teaching materials. This research uses a survey method conducted in December 2019 and January 2020. The stages of the development of



teaching materials in this research used a 4D development model adapted from Thiagarajan. The stages of development consist of define, design, develop, and disseminate. The data presented in this study is data at the defined stage of the 4D development model.

### Population and Samples

This research uses a population of high school students in the city of Malang, with a sample from three schools, namely SMA Negeri 7, MA Al-Hidayah, and Taman Madya Malang. Samples' research were randomly selected from each school and determined 75 students and three biology teaching teachers.

### Instruments

Observation sheets, questionnaires, and interviews are the instruments used. Observation sheets are used by researchers to obtain data directly by observing the learning process that is taking place. While the questionnaire sheet and interview sheet used to get data from each research sample on the use of teaching materials and the expected development needs of teaching materials.

### Procedures

The process of getting data in this research is the first observation by observing the ongoing biology learning activities, observation data obtained by filling out the prepared observation sheet. Secondly, the distribution of questionnaires openly to students to get data about learning resources used. The third is the interview with the teacher to get data about the learning process and learning resources that are often used. The third data obtained is the data used in the defined stage of the 4D development model series.

### Data Analysis

The results of the data obtained from the observation process, questionnaire distribution, and interviews were analyzed with descriptive analysis. The use of descriptive analysis in this research based on Sugiyono (2009) states that description analysis is a method that serves to describe, describe, analyze or provide a picture of the data obtained in the form of interviews, observations, or observations of problems that occur in the field.

## RESULTS

The initial data from this research is to do the direct observation, namely by observing the learning process that is taking place. Results of the observation sheet of the learning process in biology subjects obtained data as listed in Table I.

**Table I.** Observation results

No.	Observation results
1	Some students have not been focused on the learning process because not all have reference books used in the learning process
2	Some students are still passive in the learning process
3	Learning resources are used only from those used by the teacher
4	Several students talk alone with their friends during the learning process
5	The teacher becomes the center of learning

Furthermore, in this study questionnaires were also distributed to students to determine whether or not the development of teaching materials was needed or not. Based on the results of the analysis, especially in point 6, it was found that 98% of the correspondents need the



development of cooperative learning-based teaching materials, complete results data from the distribution of questionnaires to students in [Table 2](#).

**Table 2.** Questionnaire results

No.	Statement item	Results
1	Enthusiasm and motivation in biology	97.77%
2	Use of learning models or media	96.44%
3	Still experiencing difficulties in implementing the learning process	65.33%
4	The use of textbooks in the learning process	100%
5	Students use other learning resources such as modules, handouts, internet.	43.00%
6	The need to develop teaching materials based on cooperative learning	98.00%

Further data obtained from this research are data from interviews with biology teaching teachers. Based on the results of interviews with three teachers, especially in item five, all teachers answered the need to develop teaching materials based on cooperative learning. The complete data results in the following [Table 3](#).

**Table 3.** Interview result

No.	Statement Item	Result
1	The use of models, strategies, and learning media in the learning process	100%
2	The use of textbooks (textbooks) in the learning process	100%
3	Develop your teaching materials such as modules, handouts, worksheets	0%
4	Use of other learning resources such as modules, handouts.	33.33%
5	The need to develop teaching materials based on cooperative learning	100%

## DISCUSSION

Based on the results of observations that can be seen in [Table I](#) shows that the learning process is not fully running well. One factor is that there are still several students who do not have books or teaching materials as a guide. This has an impact on the students one of which he can not prepare the topic he will face, in contrast to students who have books, of course, the readiness factor he is more ready to learn the material to be studied. Irawati & Saifuddin (2018) and Perwitasari et al. (2018) in their research stated that the unavailability of teaching materials owned by students caused the students were not ready and had difficulty in following the learning process to be faced. This causes students to be less focused and tend to be passive in the learning process by the observational results obtained.

Teaching material is an important learning resource for educators and students to help the learning process. Based on the results of the distribution of questionnaires and direct interviews mentioned that much-needed learning resources, especially the development of a teaching material that can facilitate and assist in the learning process. Topic about the physiological system in humans such as the digestive system, reproductive system, excretion system, or respiratory system requires a teaching material that can help educators in delivering the topic to students. Teaching materials that are deemed appropriate and able to help provide a good understanding of physiological material are teaching materials that not only contain theory but also have the visualization in the form of pictures or symbols. The existence of images or symbols can help in providing a better understanding of a material, especially related to the physiological topic. Following Darda (2017) and Nurjannah (2018) explain that the use of media in the form of images can help students in the understanding topic. Besides, teaching materials contained in pictures will further make students interested and motivated to read and follow the learning.

Adesta, Rapani, & Khair, (2013); Jumadi, Mudiono, & Suwignyo, (2017); and Wahyuni (2019) explained that the use of images in the learning process makes students more interested and motivated to participate.

Based on the results of the questionnaire distribution, 98% of the data obtained wanted the development of teaching materials based on a cooperative approach. These results indicate that both students and educators want a teaching material that is different from teaching materials that already exist today. The expected teaching materials are teaching materials that pay attention to the condition and character of the students. So this is where an educator must be able to creatively and innovatively develop teaching material following the conditions, character, and background of students. Perwitasari et al. (2018) explained that the development of teaching materials should adjust to the condition and the immediate environment of students. Thus the development of teaching materials based on a cooperative approach is one solution. One of the advantages of teaching materials based on a cooperative approach is that one of them is the teamwork element itself which means cooperation. Teamwork provides benefits to students to practice being social. Altun (2015) and Lavasani, Afzali, Borhanzadeh, Afzali, & Davoodi (2011) explained that cooperative learning can develop social abilities.

The element of cooperation in cooperative learning will also provide a positive side to students in the learning process, one of which is being able to give a better understanding of students. There is a discussion process between students so that students can exchange ideas to gain understanding and solve the problems encountered. Setiawan & Setiawan (2019) also explained that cooperative learning makes the learning process interactive because there are elements of cooperation and interaction between students. Even more this statement is also by Sunistini, Arini, & Margunayasa (2013) which explains the existence of discussion and presentation activities conducted by students can make the KBM process not bored because of the dominance of non-dominant educators. Based on this, it is necessary to develop teaching materials. In this case, selected teaching materials in the form of modules.

Module selection Because the module is a practical and simple learning resource that can be used and translated independently by students. Purwanto, Aristo, & Suharto (2007) explained that a module is a form of teaching material that is arranged systematically by a particular curriculum and is packaged in simple learning so that it can be used independently by students. Even more clear Ardiansyah et al. (2016) explain the module is a teaching material that can facilitate student learning, both together with lecturers and independently. This independent learning process will be able to make students more active in the teaching and learning process. Wulansari (2012) explains that the existence of modules requires students to learn independently so that it can activate students in the learning process. The used module in the learning process is also able to make the learning process more efficient and effective. Mulyasa (2006) states the use of modules can make the learning process more efficient and effective. The use of modules in learning that can activate students and be able to make learning more effective and efficient will be able to improve student learning outcomes. In line with the results of research Nuryana & Aprismayanti (2013) and Simamora (2017) states the influence of the use of modules on student learning outcomes.

## CONCLUSION

Based on data processing and discussion that has been narrated above it can be concluded that 98% of students and 100% of teachers need the development of teaching materials that are appropriate to the characteristics and needs of students. Based on this data is used as a basis for developing teaching materials based on a cooperative approach to the topic of human physiology systems.



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