

E-module Characteristics of the Sensory System and Students' Perception of E-module in Class 11 SMA Trisakti Medan

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Article History

Received : 03 - 09 - 2021

Revised : 14 - 10 - 2021

Accepted : 30 - 10 - 2021

Keywords:

E -module, Sensory System, Students' Perception

Article link



Abstract

This study aims to develop an electronic module for the material of sensory system which is continued by investigating students' perceptions toward the E-module that is made. This research method is Research and Development (R&D). This research is only up to the design revision stage, not going to the mass production. This research is conducted at SMA Trisakti, Medan from March to July 2021. Previously, E-module is validated by language, material, and media validators which are classified as very suitable to be used as learning media at school. The E-module of sensory system contains cover, introduction, concept maps, book characteristics, material description, videos for learning, articles, questions for exercise with the answer keys, and bibliography. The material description will be divided into five parts. There are the eyes, nose, ears, tongue, and skin. In the E-module, it is also linked to video that can make it easier for students to understand the material. The E-module of sensory system belongs to a good category rating and interests the eleventh graders of SMA Trisakti Medan.

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Introduction

Education is a learning process that is carried out consciously and planned to be able to develop skills in accordance with interests. As a result, students will have spiritual intelligence, are able to control emotions, and have good attitudes and characters (Raharjo, 2013). The learning process needs to be planned, having objective, and rational thought so that it can develop the students' potency (Anggraeni & Akbar, 2018). In addition, one of the factors supporting the learning process is the teaching materials (Sasmito, 2017).

The use of interesting teaching materials and containing complete competences can support the learning process. Somehow, teaching materials are one of the problems that sometimes arise in the learning process. The problem is that the study of materials in all textbooks varies and the material written in textbooks is not in line with the students' characteristics (Sukerni, 2014). Moreover, teachers sometimes find it quite difficult to determine the teaching materials they want to use during the learning process because they may not necessarily be accepted by students especially during the pandemic of Covid-19.

The need of interesting teaching materials to be used during long distance learning or online learning is still lacking. Interesting teaching materials at least have characteristics, including: sequential material, learning objectives to be achieved, can motivate students to study, summaries of materials, and oriented for students individually (Sukerni, 2014). Somehow, interesting teaching materials during long distance learning or online learning can be in the form of electronic modules. The use of flipbook-based electronic modules will make it easier for students to have any access through their electronic devices, such as smartphones, laptops, or tablets. This is because learning is still done online or in a limited face-to-face condition. However, the electronic modules are the best to use and can improve students' motivation and learning outcomes (Novallyan et al., 2020). Last but not least, electronic modules are teaching materials

that contain materials systematically and interactively which will be designed into an electronic format. Then, the electronic modules can be used in long distance learning or online learning and they are used independently by the students.

The coordination system is one of the biological materials in senior high school grade eleven. The coordination system is a material that is quite difficult to understand and can lead to misconceptions (Fandilatun, 2015). One of the sub-topics in the coordination system is the sensory System. The material of sensory system contains abstract concepts that make students only guessing without observing the processes that occur in the sensory system (Adriani & Lazuardi, 2018). Somehow, in studying the sensory system, it is necessary to understand what happens to the organs in the sensory system. Therefore, in order to minimize this problem, teachers need adequate teaching materials which are teaching materials that have explanations and pictures or videos that may attract students' attention or interest.

The interview is conducted with the teacher of Biology at SMA Trisakti who gets the fact that the learning process does not use electronic modules yet. The teaching materials used are still in the form of textbooks and websites. To sum up, the interesting teaching materials that want to be used are still less. Moreover, another fact is that the teacher still has difficulties in making teaching materials by using applications (Siagian & Sinaga, 2020). However, during this distance learning, some interesting teaching materials and not monotonous are needed for students. Based on this background, the purpose of this research is to develop an electronic module for the material of sensory system which is followed by knowing students' perceptions toward the E-module that has been designed.

Methods

The method used in this research is Research and Development or R & D (Sugiyono, 2013). The product that will be produced is in the form of an electronic module as additional teaching material for distance learning during the pandemic. This study is only up to 5 stages of the 10 stages of research and development stages, which are as follows; (1) Knowing potential or problems, (2) Gathering information, (3) Product design, (4) product validation, (5) product revision. Next, a survey is conducted about the responses/perceptions of the electronic modules that is designed. The limitation of the stages of research and development is carried out by the researchers due to the limited time of the researchers and the limited cost due to the fact that the ten stages may take a relatively large amount of time and cost.

This research is conducted in May 2021 when the material comes to the sensory system. The research is conducted for the eleventh graders Even Semester for the 2020/2021 academic year at SMA Trisakti, Medan. After the E-module is designed, it is continued with the validation of the E-module by the experts of material, the media experts, and the experts of language or linguists. Furthermore, the E-module is revised and given to the students to conduct a survey about students' responses/perceptions of the E-module that is designed.

Results and Discussion

This section covers module creation and students' perceptions of E-module. The research and development steps use the Research Methods Book (Quantitative, Qualitative, and R&D) written by Sugiyono. The steps for making E-module and students' perceptions are presented as followed below.

Knowing potential or problems

This research is started from the interview of the researchers with the biology teacher of SMA Trisakti Medan. The interview is open-ended questions and it contains 7 questions containing the biology teaching materials used. The result obtained is that the learning process still uses printed books and it is explained through videos. However, SMA Trisakti Medan never uses E-module as biology teaching materials. Mrs. Bunga gave advice to the researchers to add videos so that the students can use it independently.

The researchers also conduct a survey through questionnaire about students' needs which is distributed via google form. The questionnaire contains 10 closed questions and 2 open questions and it is given to 5 students. Somehow, the students have difficulties in online learning because the teaching materials are less interesting and monotonous. The students want the teaching materials can contain interesting videos and uncomplicated explanation. Last but not least, lack of interactive teaching materials makes students lack the enthusiasm to learn the material independently.

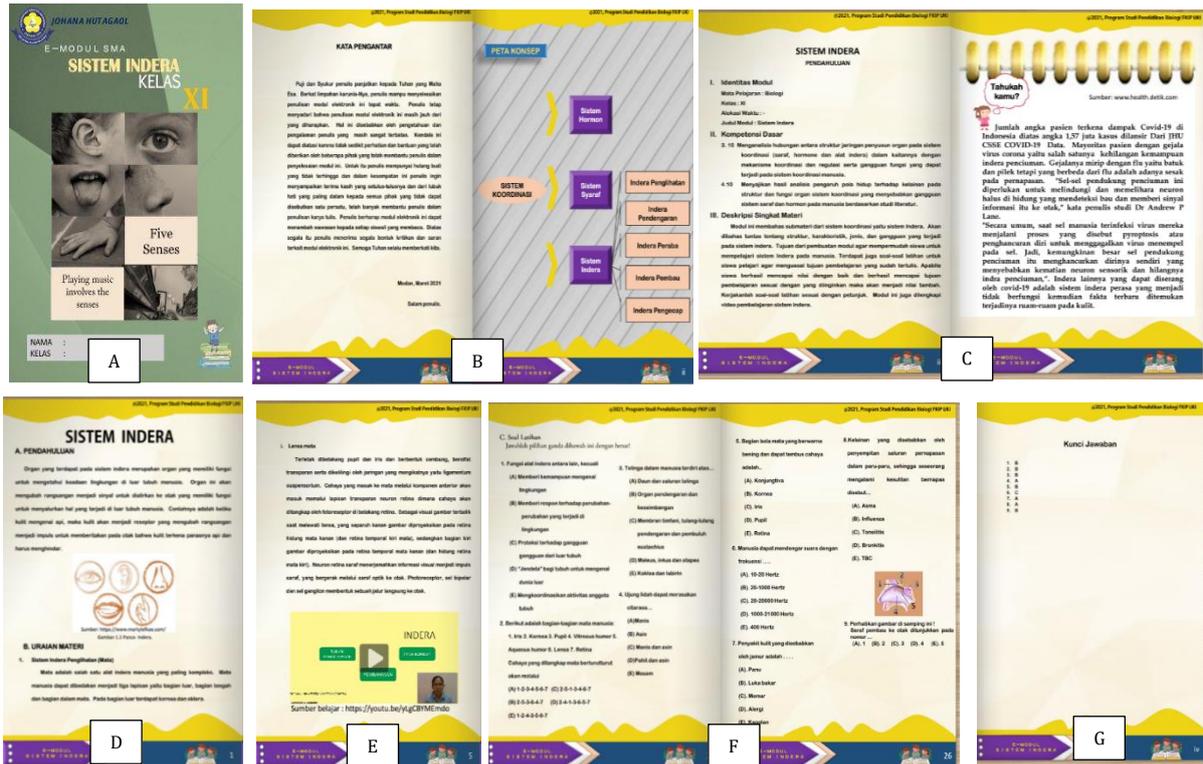


Figure 1. the look of E-module of the sensory system: (A) Cover; (B) Concept Map; (C) Sample Articles; (D) Materials look; (E) Videos for learning; (F) Answer Key (Source: Author's document)

Gathering Information

This gathering information is based on an analysis of students' needs regarding E-module which is concluded that the eleventh graders of science at SMA Trisakti Medan needs teaching materials such as E-module. Next, the technology analysis is carried out. The E-module created by using applications include: Microsoft Word, Microsoft Power Point, Flip PDF Professional, and Video Maker Applications. In addition, material analysis is carried out from various references including: KI and KD (indicator and basic competences), textbooks, reference books, scientific articles, and internet resources.

Product Design

This E-module design also contains learning materials and videos that can be played directly so that the students can read the E-module and watch the videos linked to the E-module. Moreover, the E-module contains a cover, introduction, concept map, book characteristics, material descriptions, videos, articles, questions for exercise, answer keys, and references. The material description will be divided into five parts. There are the eyes, nose, ears, tongue, and skin. At the end of each material, the description or explanation will be separated by learning videos and interesting articles. The look of the E-module is presented in the figure 1 above.

Product Validation

The E-module of the sensory system is validated by 6 (six) validators which are 2 material experts, 2 linguists, and 2 media experts. The result of the validation is presented in the table 1 and figure 2 as follows.

Table 1. Validation scores toward the E-module of the sensory system

No	Validator	Score		Percentage
		Obtained	Maximum	
1	The material expert 1	48	50	96%
2	The material expert 2	45	50	90%
The average by the material experts				93%
1	The media expert 1	22	25	88%
2	The media expert 2	23	25	92%
The average by the media experts				90%
1	The linguist 1	43	55	78%
2	The linguist 2	46	55	84%
The average by the linguists				81%

(Source: Author's document, 2021)

A teaching material is categorized as "very good" if the percentage score is 80%-100% (Zunaidah, Farida N., and Amin, 2016). Based on the validation score, the E-module of the sensory system is defined as "very good" without any revision and can be used as teaching material for the sensory system in eleventh graders of science. However, few minor improvements are still done from the validators' suggestions.

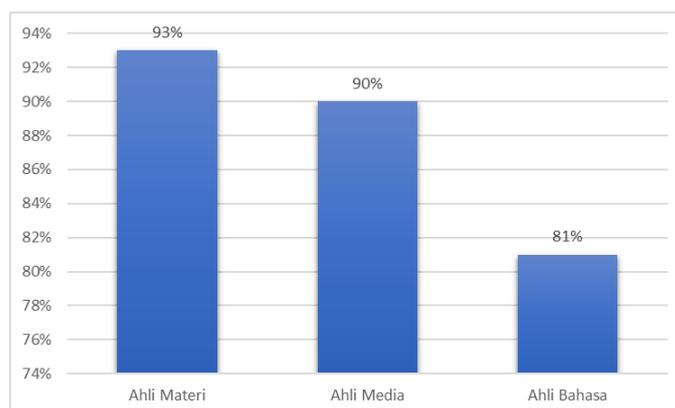


Figure 2. Validation Score
 (Source: Author's document)

Product Revision

This product revision includes cover, look, and grammar including the use of punctuation marks. However, this revision is not done too much due to the minor scale improvements. After the minor revisions, a survey is continued about students' responses/perceptions about the E-module of sensory system.

Students' Perception toward the E-module of the Sensory System

A survey of students' responses/perceptions toward the E-module of the sensory system is conducted to 60 students of class eleven of Science at SMA Trisakti Medan. Moreover, this survey is conducted to find out responses and suggestions from the students about the E-module. The students' perceptions include: presentation aspects, language aspects, and material aspects. Students' perceptions data is presented in the figure 3.

If the students' perceptions with a percentage score between 61% - 80%, the teaching materials can be categorized as good and can make the students interested (Islamia, 2019). The presentation aspect gets 63% result with the category of "good" and can make the students interested. Then, the language aspect gets 63% result with the category of "good" and can make the students interested. Last but not least, the material aspect gets 62% result the category of "good" and can make the students interested. (Islamia, 2019). Somehow, the average obtained from each aspect is 63% with the category of "good" can make the

students interested. Based on the data, the conclusion of students' perceptions is that the E-module of the sensory system gets the category of "good" and can make the students of class eleven of science at SMA Trisakti interested.

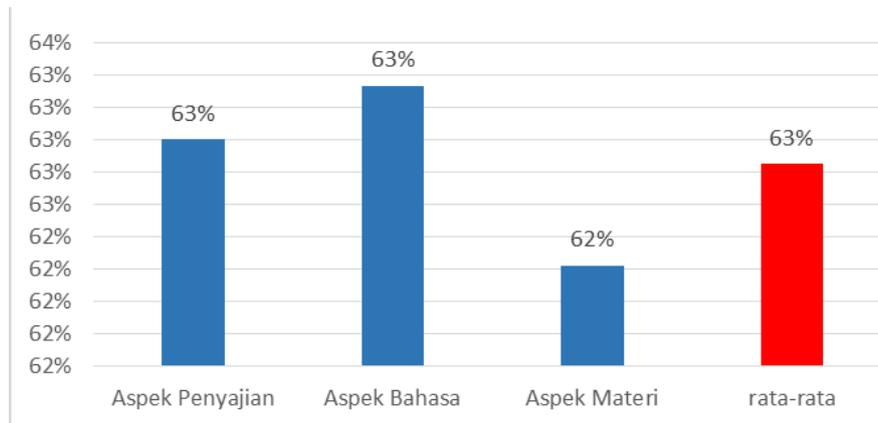


Figure 3. The students' perceptions toward the E-module of the Sensory System (Source: Author's document)

Good or positive perceptions or responses to books or modules will motivate readers or students to remember some important things in the book (Adinugraha, 2018). The internal factors that influence interest of reading include feelings, attention, and motivation (Mumpuni & Nurbaeti 2019). According to Sutijono (2005) in Machin (2012), the success of using media in learning process to improve learning outcomes depends on the content of the message, how to explain the message, and the characteristics of the recipient of the message. Then, this shows that it does not mean that the more sophisticated the media used, the higher the learning outcomes or vice versa (Adinugraha, 2018). Moreover, students with various differences in physical, mental, environmental, family, personality, intellectual abilities, interests, and talents should make the teacher understanding these differences so that the learning objectives can be achieved (Muslich, 2021). Therefore, learning media in the form of teaching materials should look at the school conditions and the students' characteristics.

Conclusions and Recommendations

The E-module of the sensory system contains covers, introductions, concept maps, book characteristics, material descriptions, videos for learning, articles, questions for exercise with the answer keys, and bibliography. In addition, the material description will be divided into five parts. There are the eyes, nose, ears, tongue, and skin. In the E-module, it is also linked the videos for learning that make it easier for students to understand the material. Last but not least, the E-module of the sensory system gets the category of "good" and can make the students of class eleven of science at SMA Trisakti interested.

The suggestion in this article is that a teacher should be able to choose the right and best media for teaching materials for the students so that the learning process can run well. It can be much better if the teacher is able to be creative and innovative in making modules because the characteristics of each school are different. The limitation in this study is that the E-module of the sensory system is not tested yet for the effectiveness in the experimental class.

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