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Development of Interactive Learning Media on Coordination System Topics Using Adobe Flash CS8 for Class XI Students

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Abstract
This research aims to create interactive learning media that can help class XI high school students understand Coordination system material, which students at SMAN 1 Muaro Jambi found difficult to understand based on observation results. The development model used is the ADDIE model which consists of the stages of Analysis, Design, Development, Implementation and Evaluation. The data collected consists of qualitative and quantitative types. Qualitative data was obtained from validator questionnaires, while quantitative data was obtained from student and teacher perception questionnaires. After validation by media experts 2 times and material experts 3 times, the learning media developed received a very good final score. Trials were carried out on small groups (8 students) and large groups (20 students) at SMAN 8 Muaro Jambi, which resulted in very good scores. Biology subject teachers' perceptions also show a very good assessment of this learning media. Thus, Interactive Learning Media on the subject of Coordination Systems Using Adobe Flash CS8 for Class This media can also be an alternative for students in independent learning. This research can be a reference in developing relevant learning media products in the future.

Keywords: Adobe Flash CS8; Interactiv; Multimedia Development; System Coordination

INTRODUCTION

Education is the main foundation for individual and societal development. In the scope of education, the use of learning media has an important role in increasing the effectiveness of the learning process (Brandenberger et al., 2017; Selwyn, 2015). In the current digital era, the development of interactive learning media is becoming increasingly relevant because it can increase student engagement and facilitate understanding of complex concepts.

Learning is an important aspect in individual and societal development. In the context of modern education, the use of learning media is becoming increasingly relevant to increase the effectiveness of the learning process (Noor-Ul-Amin, 2013; Pourhosein Gilakjani et al., 2013). In the current digital era, especially with the development of information and communication technology, interactive learning

media is a solution that has great potential in providing a more interesting and effective learning experience (Kirkwood & Price, 2017). The use of technology in learning allows students to be actively involved in the learning process, improve understanding of concepts, and develop skills needed in the real world (BADA, 2016). Therefore, this research aims to develop innovative and effective interactive learning media, especially in the context of learning coordination system material for class XI high school students. By using a structured approach and appropriate technology, it is hoped that the learning media developed can make a positive contribution in improving the quality of learning and students' understanding of this complex material (Sadler, 2010).

Biology plays a crucial role in understanding life, both at the organism, population and ecosystem levels. In the modern world full of biological complexity, learning is the main key to understanding the basic principles of biology and their applications in everyday life (Tibell & Harms, 2017). One of the main challenges in teaching biology is conveying often complex material effectively to students. In this case, the use of interactive learning media appears as an interesting and relevant solution (Brownell et al., 2013). With this media, students can not only hone their understanding of the material, but also deepen their skills in analyzing and interpreting biological information (Ardan, 2016). Therefore, this research aims to develop interactive learning media that uses the latest technology in the context of biology learning, especially in coordination system material. Through this approach, it is hoped that biology learning can become more interesting, engaging and effective in preparing students to understand and apply biological concepts in their lives.

One of the materials that high school students often encounter is the Coordination system, which includes an understanding of the human body's organs and their functions. However, based on observations made at SMAN 1 Muaro Jambi, it was found that the majority of students had difficulty understanding this material. In fact, as many as 56% of students find the Coordination system material difficult to understand, while there are still many students who have not achieved the KKM score in daily assessments.

This observation shows the need to develop learning media that can help students understand complex concepts in the Coordination system. Therefore, this research aims to develop an interactive learning media using Adobe Flash CS8, which is expected to provide solutions to problems in understanding this material. With the interactive learning media developed through this research, it is hoped that it can help students understand the concept of Coordination systems more thoroughly and in depth. Apart from that, it is also hoped that the results of this research can be a contributory contribution to the development of innovative and effective learning methods in the future.

Researchers chose SMAN 1 Muaro Jambi to conduct observations. Observation results showed that as many as 56% of students felt that the Coordination System material was difficult to understand and required the use of media to facilitate the delivery of learning material. Observations also show that there are still many students who have not reached the KKM score, namely 65, in their daily scores. With this problem as a background, researchers are interested in conducting development research entitled "Development of Interactive Learning Media on Coordination System Topics Using Adobe Flash CS8 for Class XI High School Students".

RESEARCH METHODS

Research Design

This research is Design and Development research. Design and Development research has three important stages that are commonly carried out by designers and developers, namely concept development of a model (conceptual development of model), product development (product and tools development), and field testing (field tests) (Rusdi, 2018). This is in accordance with the development carried out by researchers, namely designing a biological electronic module on Coordination Systems material for high school. The steps in the ADDIE development model proposed by Rusdi (2018, 119) are used as a guide in this research.

Research Target/Subject

The level of validation and attractiveness of learning media is determined through the results of analysis of trial activities carried out through several stages as follows:

1) Review by subject matter experts and review by learning design experts
2) Small group trials
3) Large group trials
4) Subject teacher trials

The subjects of this research are class XI high school students, especially at SMAN 1 Muaro Jambi, as well as biology subject teachers who will use the learning media developed in this research..

Research Procedure

The procedure for developing biology learning media on the subject of coordination systems using Adobe Flash Professional CS8 involves a series of systematic steps. The first step is to collect material that will be presented in learning media. After the material has been collected, the next step is to create learning media based on the material that has been collected. Then, preparations were made by providing design validation sheets, material content validation, and response questionnaires to collect input from experts and potential users. After that, validation of the learning materials and media was carried out by experts in the fields of study and learning design. The next step is to test learning media on small groups of students as an initial stage of testing. After getting input from small group trials, trials were carried out on large groups of students to measure effectiveness and wider response to learning media. Finally, learning media was also tested on subject teachers to evaluate its feasibility and usefulness in supporting the learning process in the classroom. With this structured development process, it is hoped that learning media can become an effective tool in increasing students' understanding of coordination system material in biology learning.

Instruments, and Data Collection Techniques

To collect comprehensive data in developing biology learning media about coordination systems, several instruments and data collection techniques were used. First, the design validation sheet is used to obtain input from learning design experts regarding visual, interactive aspects, and the suitability of the design to the principles of effective learning. Then, the material content validation sheet is used to collect evaluations from subject matter experts regarding the accuracy, relevance and clarity of information in learning media. In addition, a response questionnaire is used to obtain responses from potential users such as students and teachers regarding the attractiveness, effectiveness and usefulness of learning media in supporting the learning process.

Apart from these instruments, data collection techniques also involve testing on small groups of students as an initial stage of evaluation, where students provide direct responses to experiences using learning media. Next, trials on large groups of students were carried out to measure the response and effectiveness of the media on a wider scale. Finally, testing with subject teachers is used to obtain professional and pedagogical input regarding the feasibility, usefulness and potential of integrating learning media in their curriculum and teaching methods. With this combination of instruments and data collection techniques, research can obtain holistic and relevant information to better improve and develop learning media.

Data analysis technique

To analyze data collected from various instruments and data collection techniques, this research will use qualitative and quantitative analysis approaches. First, data from the design validation sheet and material content validation sheet will be analyzed qualitatively. This involves the process of identifying patterns, themes, and aspects that emerge from expert evaluation of the design and content of learning media. Furthermore, responses from the questionnaire will also be analyzed qualitatively to explore the opinions, perceptions and suggestions provided by respondents. Apart from qualitative analysis, data from the questionnaire will also be analyzed quantitatively using descriptive statistical methods. This will involve calculating frequencies, percentages, and means to evaluate how much respondents agree or disagree with

certain statements in the questionnaire. In addition, data from trials in small groups and large groups will be analyzed quantitatively to determine the score or rating of the success of the learning media in achieving learning objectives.

RESULTS AND DISCUSSION

The development of interactive learning media on the subject of Coordination Systems using Adobe Flash CS8 for Class XI SMA students has gone through a series of stages in accordance with the ADDIE model. The results of this process include the validator's assessment of the proposed media design, the validator's assessment of the content of the interactive media being developed, the perception of the test subjects (students) regarding the use of the media (through small group trials and large group trials), the teacher's perception biology subjects, as well as the final design of the product being developed.

This research succeeded in producing interactive learning media on the subject of Coordination Systems using Adobe Flash CS8 for Class XI SMA students. Based on the validator's assessment, both of the design and content of the interactive media developed, the results were very positive. The media design is assessed in accordance with the principles of effective learning design, while the material content is assessed as accurate, relevant and clear.

Apart from that, the results of small group and large group trials show that this learning media succeeded in getting good responses from students. They responded positively to the use of media to support the learning process, which indicates the effectiveness of media in helping understand the material. Not only that, the perception of biology subject teachers is also very positive. They see the potential for this learning media to be used in teaching coordination system material in class, as well as providing useful input for further improvements.

Thus, the results of this research indicate that the Interactive Learning Media developed is suitable for use as a learning aid in high school, especially in teaching coordination system material. This media is expected to increase students' understanding and provide a more interesting and interactive learning experience. The implications of this research are diverse and significant. First, this research makes a contribution to increasing interactive learning, especially in the context of coordination systems material in the field of biology. The learning media developed can be a model for the development of other interactive learning media, which has the potential to increase student engagement and improve understanding of complex concepts.

Apart from that, the results of this research have a positive impact on the development of teaching methods. Teachers can use this interactive learning media as a tool in the teaching process, improve the quality of learning in the classroom, and increase student interest and motivation in studying difficult material.The implications of this research also include curriculum development. The findings from this research can provide input for curriculum development at the school level, with the integration of interactive learning media which can strengthen technology-based learning approaches and increase the relevance of the curriculum to student needs and current developments.

Apart from that, this research also encourages further research to be carried out. Further research can focus on improving technology, evaluating the effectiveness of learning media, and developing innovative learning strategies.Overall, this research has broad implications in improving the quality of learning, developing effective teaching methods, and encouraging innovation in the fields of education and learning technology.

CONCLUSION

The conclusion of this research is that the development of Interactive Learning Media using Adobe Flash CS8 for the Coordination System Subject for Class XI SMA Students has succeeded in creating an effective learning tool and is expected to increase students' understanding of the material. The trial results showed a positive response from students and teachers, confirming the potential of this media in improving

the quality of learning. The implications of this research include contributions to the development of innovative learning methods and encouragement for further research in the field of interactive learning media development. Thus, this research becomes the basis for developing more effective and interesting learning in the future.

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