Development of Macromedia Flash-Based ScienceLearning Media to Improve Learning Outcome of Students in Tanjungkubah 16 State Elementary School

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Abstract. This study aims to produce a macromedia flash-based science learning media that isvalid, feasible and effective to use in improving student learning outcomes on the subject of human digestive organs. This research was conducted at UPT SD Negeri 16 Tanjungkubah. Expert Team that a percentage of 85.15% is obtained, which means that it is very valid, learning design experts get a percentage of 91.11% and media experts get a percentage of 82 .29%, then the science learning media based on macromedia flash was declared very valid by the validator for learning media at UPTD SD Negeri 16 Tanjungkubah. Based on the results of the recapitulation of student response questionnaires that have been carried out on 25 students, 2 students (8%) stated that they were not eligible for the developed media, and 23 students (92%). Then the science learning media based on macromedia flash is declared feasible.

Keywords: Science Learning Media, Macromedia flash, Digestive system in humans

1 Introduction

A teacher is in charge of organizing, directing and creating an atmosphere of learning activities that can achieve national education goals. In addition, a teacher in addition to mastering teaching materials, of course it is also necessary to prepare optimal learning strategies, one of which is choosing the right learning model so that the teacher's teaching task can run effectively and students will be motivated to play an active role in learning activities which ultimately can lead to learning outcomes. obtain optimal learning outcomes.

Besides using correct learning and assessment strategies, teachers need to realize that their role is not only as a transfer of knowledge, but also as a facilitator and motivator. This agrees with Fajri (2019: 65) who argues that learning activities should not only focus on the teacher, but must also involve students. Teachers must also be aware of the changes in the learning process, from teacher-centered to student-centered, from one-way to interactive, from passive to active-investigating, from single tool to multimedia, from isolation to network environment, from one-way to cooperative relationships, from abstract to contextual, and

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from personal learning to team-based (Kemdikbud, 2014).

Natural Sciences (IPA) is one of the subjects that requires the right media and is considered an important subject in the world of education. Learning science aims to find out about nature systematically, so that it is not only mastery of a collection of knowledge in the form of facts, concepts, or principles but also a process of discovery. Besides that, science is also an empirical science and discusses facts and natural phenomena and develops through scientific methods such as observation and experiment. Facts about natural phenomena cannot be conveyed entirely due to the limitations of space, time, and limited space. As a result, the science learning process requires an update that allows students to understand science lessons. In order that helping the students to find out the concepts or principle in the activity of learning science. It is needed mediafor learning that is able to guide the students inthe process of discovery.

Learning media used in learning activities can affect the effectiveness of learning. Media has functions and benefits as a means for teachers to be able to deliver subject matterto be more interesting and not monotonous. This is in accordance with the opinion of Harahap, et al (2015. 643) that learning media will make a practical contribution, especiallyin the implementation of the learning process for teachers, where this learning media is a teacher's teaching material to facilitate the delivery of material.

Planning for media development is expected to produce products that are interesting and different from the usual, namely by applying Macromedia Flash 8 learning media which is one of the computer software used to design animation. According to Arsyad (in Fitri, et al. 2019: 25) macromedia flash 8 has many advantages in the learning process, namely improving the teaching system, being more comfortable, making teaching easier, and shortening time. The learning process using Macromedia Flash 8 students not only imagine, but can see firsthand the concepts explained by the teacher. By using flash-based learning media, the material to be conveyed can be given more complete and more interesting, more time efficient, besides that by using animation in the learning and also increasing the students' outcome in the grade V of elementry of UPT SD 16 Tanjungkubah.

Based on observations at the UPT SD Negeri 16 Tanjungkubah which is located at Jl. Syarifuddin Hamlet I Tanjungkubah Village, Kec. White Water, Kab. Coal and has 2 classes for level V with an average number of students per class is 25 people. The school has implemented the 2013 Curriculum learning, has facilities that support research and has classroom teachers who want to make innovations in the learning process. However, overall learning has not been maximally carried out, so the test scores in the subject of Human Digestive Organs at UPT SD Negeri 16 Tanjungkubah are still not satisfactory, on average there are 12 students in each class who must take remedial. The KKM score at UPT SD Negeri 16 Tanjungkubah is 75,

With the flash-based media learning the human digestive organs will be more interesting and clearer. In addition, according to him, the subject of the Human Digestive Organ is a subject with the learning outcomes of students in the lowest cognitive domain in the subject of class V with details of the value of 25 students, only 9 students who scored above the KKM on the subject of the Human Digestive Organ or about 74.29% of students did not complete the score for the test scores on the Human Digestive Organs subject test.

Based on the background of the problem described above, the researcher intends to conduct research on the development of science learning media based on macromedia flash atUPT SD Negeri 16 Tanjungkubah to improve students' learning outcomes of natural science.

2 Research Methods

Based on the formulation of the problem and the research objectives that have been determined, the research to be carried out is categorized into the type of research and development. The type of development model that will be carried out in product development is based on the ADDIE development model. This model was chosen because it can be developed systematically and is based on the theoretical foundation of learning design. This research was conducted at the UPT SD Negeri 16 Tanjungkubah on Jl. Syarifuddin Dusun I Tanjungkubah Village, Air Putih District, Batubara Regency, Postal Code. 21256. The subject of this research is the fifth grade students, totaling 25 people as the subject of the effectiveness test stage. These criteria are used based on purposive sampling technique. According to Sugiyono (2014) the purposive sampling technique is a way of determining the sample based on certain considerations. The object of this research is the science learning media based on macromedia flash on the subject of the Human Digestive Organ. The manufacture of the product is guided by the storyboard design that has been made. If the design has been assessed as good, the media development process is increased to the next stage, which is to continue making media based on the storyboard and design that has been made in Figure 1:

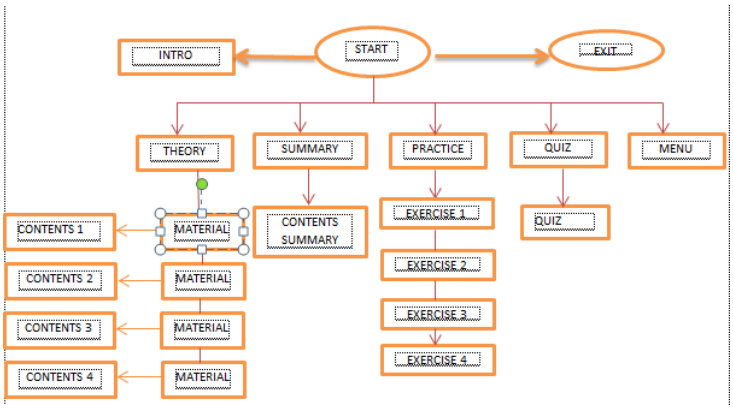

Figure 1. Storyboard and design

3 Research Result

3.1 Stages of Analysis

In the analysis there are 3 stages, namely curriculum analysis, student character analysis and needs analysis. Curriculum analysis is in the form of an analysis carried out by selecting science material taught by media, as well as analyzing Competency Standards, Basic

Competencies and indicators that must be achieved by students. Analysis of the characteristics of students, in addition to the material developed, it is also necessary to know the characteristics of students as targets for the development of this media. The analysis of the students was carried out to determine the characteristics of the fifth grade elementary school students. Needs Analysis, analysis of the use of learning media aims to determine the extent of the use of media used during science learning and how the media is made in order to meet the needs of students.

3.2 Design Stages

The second stage is the stage of making the developed media design, the learning media in this study were compiled using macromedia flash 8 software. At this stage the researchers determined the elements contained in the developed learning media.

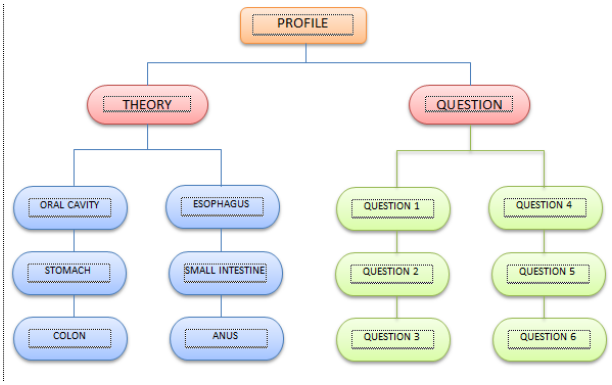

Figure 2. Product Development Flowchart Design

3.3 Development Stage

The first step taken by researchers in developing this media is to summarize and collect material to be included in the media. The material was taken based on the results of the previous analysis, namely the human digestive organs in Class V. Next, the researchers collected video, audio, and animation as supporting material in the media. After all the materials have been collected, the next step is to combine all the materials into an interactive multimedia-based learning media using the Macromedia Flash Professional 8 application.

The media that has been created is then validated by one media expert validator, one material expert and one learning design expert, and class teacher.

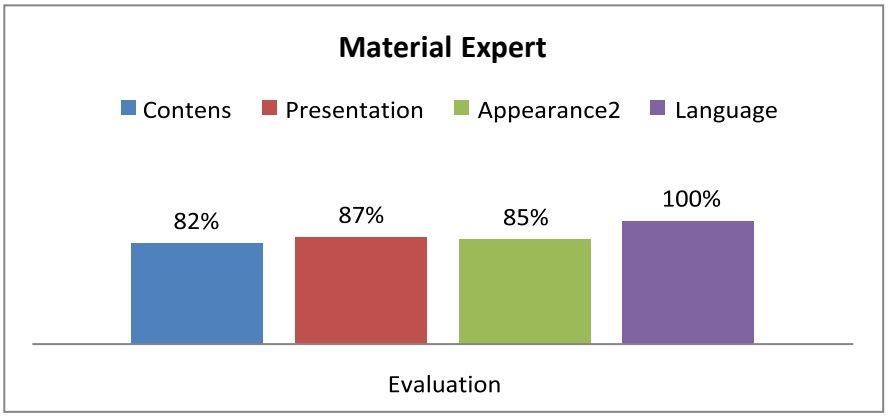

Figure 3. Graph of Material Expert

Based on the above calculation, the percentage range obtained is between 81.26% < P 100% that is equal to 85.15% and states very valid.

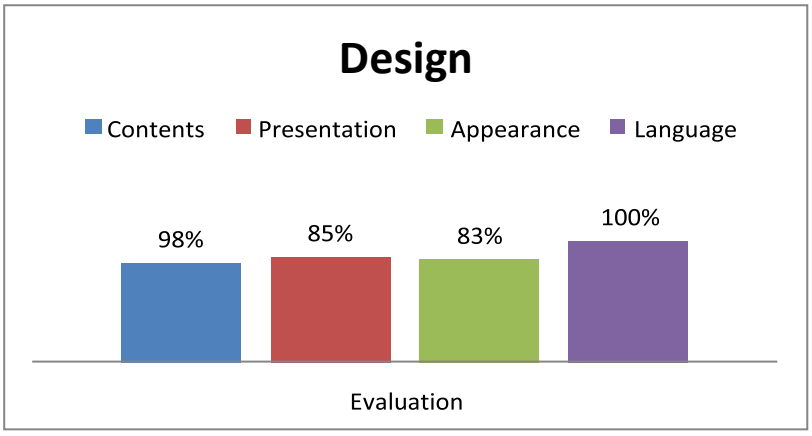

Figure 4. Graph of Evaluation Design

Based on the above calculation, the percentage range obtained from learning design experts is between 81.26% < P □ 100% that is equal to 91.11% and states that it is very valid without any data being corrected.

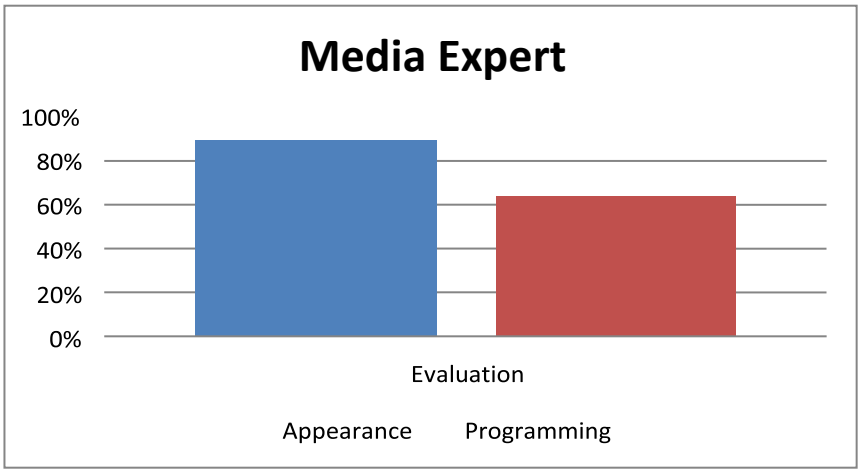

Figure 5. Graph of Media Expert

Based on the above calculation, the percentage range obtained is between 81.26% < P □ 100% that is equal to 82.29% and states very valid.

3.4 Implementation Stage

At this stage, the macromedia flash learning media that has been developed is then implemented for the fifth grade students of SD Negeri 16 Tanjungkubah. The instruments used in this implementation phase are in the form of student response questionnaires and pre- test and post-test questions. The following are the results of students' responses to media related recaps:

Table 1. Student Response

No	Criteria	Total students
1	Very worth it	10
2	Worthy	8
3	Decent enough	5
4	Not worth it	2

Based on the results of the recapitulation of the student response questionnaires that have been carried out, it can be obtained that 25 students stated that they were eligible and 2 students stated that they were not worthy of the media developed.

3.5 Evaluation Stage

Furthermore, at the evaluation stage, the effectiveness of the learning media developed will be tested obtained from the results of student learning tests assessed through pre-test and post-test. The following is a recapitulation of pre-test and post-test scores of student learning outcomes.

Table 2. Recapitulation of Values

Pretest Score			Posttest score	
No	Value Range	Total students	Value Range	Total students
1	0 - 27	2	0 - 27	0
2	28 - 47	14	28 - 47	2
3	48 - 74	7	48 - 74	0
4	75 - 100	2	75 - 100	23
Amount		25	-	25

achievement of student learning completeness criteria if in the class there are 85% who have achieved KB 65%.

The results of the acquisition of mastery learning obtained by 92%, then the media developed can be declared effective to improve student learning outcomes, especially on the material digestive organs in humans. The following is a graph of the results of student pretest and posttest assessments:

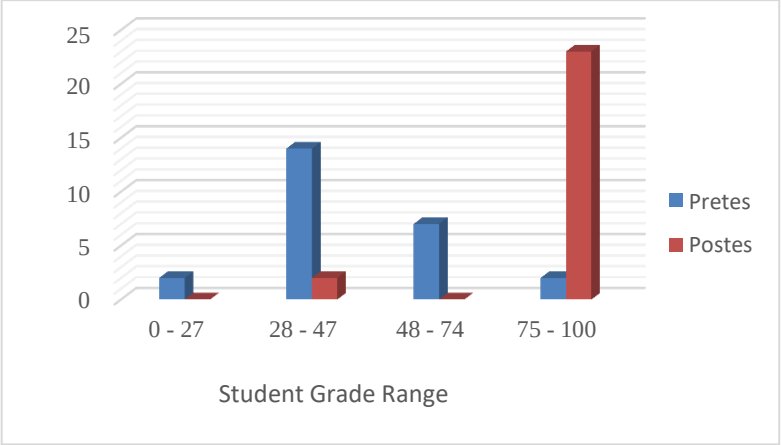

Figure 6. Graph of results of student pretest and posttest assessments

3.6 Discussion

In the learning process the teacher plays an important role in delivering learning materials to students. The role of this teacher makes the teacher must be able to master and develop the teaching materials needed by students. In accordance with the development of science and technology, the development of learning media is needed to assist students in understanding the learning material. With the media will foster student interest in studying natural science lessons. This is in line with Arsyad (2016: 17) which states that learning media are educational facilities or aids that can be used as intermediaries in the learning process to enhance effectiveness and efficiency in achieving teaching goals. According to Wahid (2018: 3), the role of educational

media is very important,
Learning systems using media provide opportunities for students to be more active in learning, tend not to be boring, and are liked by students because of their attractive presentation. Therefore, the use of learning media using Macromedia Flash Professional 8 on the material of the digestive organ system in humans is expected to support the success of student learning outcomes. In line with Setyono, et al (2017) stated that Macromedia Flash 8 is software that contains facilities for making designs and interactive media that are carried out professionally as well as matters relating to the facilities needed to compose multimedia content.

The product development in this study was carried out in 5 stages, namely the first, the analysis stage to determine the initial needs in developing learning media, the second stage was the design of learning media which was the stage of making the developed media design, the learning media in this study were compiled using macromedia flash 8 software, the stages The third is product development and manufacture, which is the manufacture of media based on storyboards and designs that have been made. In addition, the things that are done include: typing material and practice question texts, making animations, pictures, navigation buttons and giving music, then the fourth stage is implementation, which is a stage to determine the practicality of operating learning media, student responses to the media used. used, and whether or not the science learning media should be produced and disseminated. The last stage is evaluation, which is the stage of evaluating student learning outcomes data through tests.
Based on the results of the assessment of the material experts who have been assessed as in Table 4.1, it can be seen that the statements related to product assessment are 32 items with 4 aspects, there are 13 items of Very Good score and 19 items of Good score. Furthermore, the material expert concluded that the product developed was VALID and there was data that was improved by adding a summary at the end of the material. The results of the design expert's assessment that have been assessed are as shown in Table 4.2, it can be seen that the statements related to product evaluation are 31 items with 3 aspects, obtained an assessment of a Very Good score of 21 items and a Good score of 10 items. Furthermore , the design expert concluded that the product developed was VALID without any data being corrected . Research results can obtain a valid assessment from Material and Design Experts, because the product has given students the opportunity to gain hands-on experience through interesting pictures and videos. This is as expected in the objectives of science learning according to Prabowo (2015), namely science learning by providing direct experience can grow cognitive thinking skills (cognitive thinking skills), psychomotor skills (psychomotor skills) and social skills (social skills).

Furthermore, the results of the assessment of media experts who have been assessed as in Table 4.3 above, it can be seen that the statements related to product assessment are 24 items with 2 aspects, obtained an assessment of a Very Good score of 10 items and a Good score of 11 items, and 3 items with a poor score. related to programming aspects. Furthermore, the media expert concluded that the product developed was ENOUGH VALID with corrected data. The results of this assessment can occur because the manufacture of products based on Macromedia Flash is very interesting as a learning medium. As stated by Masykur, et al (2017: 6) that Macromedia

Flash is a multimedia platform and software used for the creation of animations, games and internet enrichment applications that can be viewed, played.
The results of the assessments given by the Expert Team Validation of materials, designs and media, the overall product developed is declared VALID with a few corrected data. This is in accordance with the results of previous research conducted by Harahap, et al (2015) concluding

that the validation results from a team of material, language, and media design experts on the feasibility of developing Macromedia flash-based interactive teaching media in accordance with the overall assessment indicators are included in the criteria. "Very Good" so that it can be accepted and suitable for use in the learning process.

After the researchers conducted product validation tests by material, design and media experts, from some assessment results that were still lacking and needed to be improved, the researchers improved the media according to the indicators that still needed to be improved. After the media has been repaired according to the direction of the validation expert team, it is time for the media to be tested or implemented on the selected sample, namely the fifth grade students of SD Negeri 16 Tanjungkubah to determine the feasibility of the macromedia flash learning media that has been developed.

Based on the results of the recapitulation of student response questionnaires that have been carried out, it can be seen that 23 students stated that they were eligible and 2 students stated that they were not worthy of the media developed. Therefore, the researcher calculated the percentage of eligibility according to student responses. To determine the achievement of learning objectives in terms of student responses, if the number of students who gave positive responses was greater than or equal to 80% of the many subjects studied for each trial, and the results obtained were obtained by 93.75% then the media developed is declared feasible. This is in accordance with the results of previous research by Naniek (2015) with his research on the development of science learning tools with macromedia flash displays in elementary schools aimed at improving students' science learning.

Furthermore, at the evaluation stage, the effectiveness of the learning media developed will be tested obtained from the results of student learning tests assessed through pre-test and post-test. Based on the data from Table 4.5, the final achievement of this study is only to increase learning outcomes by achieving student learning completeness criteria if in the class there are 85% who have achieved KB 65%. The results of the acquisition of learning mastery are obtained by 92%, then the media developed can be declared effective to improve student learning outcomes. The results obtained are in accordance with the results of previous studies, namely There is research from Pardede, et al (2016) this study aims to determine whether there is a significant difference between the science process skills of students who are taught using a collaborative-based guided discovery learning model using flash media and conventional learning. The sample in this study was taken by cluster random sampling. The experimental class was given a guided discovery learning model based on collaboration using flash media, the control class was given a conventional learning model. The results showed that there was a significant difference between the science process skills of students who were given a collaborative-based guided discovery learning model using flash media and conventional learning. from these results it can be concluded that the collaborative-based guided discovery learning model using flash media is better in improving students' science process skills. In this study, researchers only looked at students' science process skills and also used a different learning model, namely collaborative-based guided discovery compared to conventional methods. This research prioritizes science skills rather than student learning outcomes.

4 Conclusion

Based on the data from the research and discussion that have been described, the following

conclusions can be drawn:
Based on the recapitulation of the Material Validator Expert Team, a percentage of 85.15% was obtained, the learning design expert obtained a percentage of 91.11% and the media expert obtained a percentage of 82.29%, then the science learning media based on macromedia flash was declared very valid by the validator for learning media at UPTD SD Negeri 16 Tanjungkubah. Based on the results of the recapitulation of student response questionnaires that have been carried out on 25 students, 2 students (8%) stated that they were not eligible for the media developed, and 23 students (92%). Then the science learning media based on macromedia flash is declared feasible. Based on the results of the acquisition of mastery learning obtained by 92%, then the science learning media based on macromedia flash developed can be declared effective to improve student learning outcomes

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