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Development of an Interactive E-Module for Human Digestive System Material

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Abstract
This research aims to develop a product in the form of Interactive E-Module media for Human Digestive System Material. This research uses the Research and Development method. This research was carried out at SDN Nagalintang. Results Validation of Interactive E-Module media was carried out by experts such as material experts, media experts and language experts. Each expert is as follows: material experts give a final score of 0.92 with eligibility criteria of 92% or you could say "Very Eligible", media experts give a score of 0.88 with eligibility criteria of 88% or you could say "Very Eligible", and experts language gives a score of 1 with eligibility criteria of 100% or you could say "Very Eligible". The results of the small group trial obtained an average score of 95.6% with the eligibility criteria "Very Feasible", and the results of the large group trial obtained an average score of 95.4% with the eligibility criteria "Very Eligible". This shows that the Interactive E-Module media is very suitable as a natural science learning medium, especially regarding the human digestive system. At the field research stage, the Interactive E-Module media obtained an average N-gain score of 0.8 in the "High" category and the interpretation category "Effective". Based on the results obtained, the Interactive E-Module was declared feasible and effective for use in elementary schools.
Keywords: Learning media, Interactive E-Module, Human Digestive System

INTRODUCTION

Education is very important in this era of globalization and is even included in the basic needs of every human being because by obtaining education humans will be able to improve their quality of life. According to Tukiran (2020:133), the higher the quality of a country's education, the higher the quality of human resources that can advance and make the country proud. In reality, there are still several countries that have not fulfilled their citizens' rights to obtain education. Even though education is the right of every citizen. In Indonesia, this is stated in the 1945 Constitution, article 31 paragraph 1, which states that every citizen has the right to education. However, until now many of the nation's children have not received the education they should because the condition of education in Indonesia still has many problems from various factors.

The condition of education in Indonesia can be seen in the results of research on the quality of education in several countries conducted by The World Bank, World Development Report (2007), which placed Indonesia in 39th place out of 41 countries studied, and a survey of student abilities conducted released by the Program for International Student Assessment (PISA) in December 2019 in Paris, placed Indonesia in 74th place out of 79 countries. Being in the bottom 6th place, it is still behind neighboring countries such as Malaysia and Brunei Darussalam. Judging from these data, it shows that education in Indonesia is still far behind other countries. (Kurniawati, 2022:2).

The low quality of education in Indonesia is caused by several factors. According to Kurniawati (2022:11) there are 2 problems that cause the low quality of education in Indonesia,

the first is the problem of education in the macro scope, namely a confusing and too complex curriculum, unequal education, problems teacher placement, low quality of teachers and expensive education costs. In the micro scope, namely monotonous learning methods, inadequate facilities and infrastructure, and low student achievement. Various efforts have been made by the government to ensure the continuity of education towards a better level. This can be seen from the contents of the 1945 Constitution, Article 31 paragraphs 3 and 4, this article emphasizes that the government is obliged to undertake the implementation of national education in an effort to make the nation's life more intelligent as regulated in the law by prioritizing the budget for education of at least 20% of the APBN. (Income Budget and Indonesian State Expenditure) and APBD (Regional Revenue and Expenditure Budget). Based on the results of observations and interviews conducted with fifth grade teachers in several elementary schools in Tasikmalaya Regency and City, these schools, including SDN 8 Singaparna, SDN 2 Tenjonagara, SDN Nagalintang, and SDN Sirnagalih, on December 12-13 2022, found several problems with science subjects, such as: students are not focused when studying, many students are in and out of class while studying, the grades obtained by students are still not optimal, many students have grades below the KKM, students do not understand the material, especially the material on the human digestive system because this chapter is the material extensive and many terms that are difficult to remember, as well as the lack of use of media in learning.

Based on the findings and results of observations and interviews in the field, the researchers tried to develop an E-Module on the human digestive system material. Daryanto (2014:23) revealed that a module is a set of teaching materials that are structured to create a teaching and learning experience for students so that the desired learning objectives are achieved. This opinion is also supported by Hamdani (2015:14) who states that modules are a medium used to convey lessons so that students can learn independently to achieve certain competencies whose preparation is made systematically in the form of learning materials, learning activities, exercises and evaluations. As technology develops, printed modules can be converted to electronic modules. Electronic modules are modifications of conventional modules by combining the use of information technology, so that existing modules can be interesting and interactive. Based on the description of the background to the problem above, this research will focus on developing an Interactive E-Module for Human Digestive System Material.

RESEARCH METHODS

The type of research used in this research is the type of research and development "Research and Development" or also commonly referred to as (R&D). The selection of the type of research and development is based on the fact that this research is intended to create a product in the form of Electronic Module (E-Module) learning media that can be used in learning science subjects, which is in line with the definition of R&D according to Sugiyono (2019: 297) that " Research and Development is a research method used to produce certain products, and test the effectiveness of these products. The research design that will be used by researchers is in accordance with what has been stated by Borg and Gall in Sukmadinata (2017: 169-170) that there are 10 steps in compiling a development method, namely as follows: 1) Research and data collection, 2) Planning, 3) Initial product development, 4) Initial field trials, 5) Initial Revisions, 6) Main field trials, 7) Product Revisions, 8) Operational field tests, 9) Final product revisions, 10) Product dissemination and implementation. However, this research stage only reached stage 7, namely the product revision stage, namely producing Interactive E-Module media for Human Digestive System Material. This research and development does not

reach the final stage and the operational field testing stage to mass production of the product can be carried out in further research.

The development of this design involves expert assessment before the main field trial is carried out, so that the learning media developed has been revised based on the expert's assessment, input and suggestions. Media expert validation, carried out by Mohammad Fahmi Nugraha, M.Pd. The language expert was carried out by Anggia Suci Pratiwi, M.Pd, and the material expert was carried out by Ai Nurlaela, S.Pd as the class teacher. Then a small group trial was carried out on 5 students of SDN 2 Tenjonagara and a large group test on 10 students of SDN Sirnagalih. After conducting the initial field trial, the main field trial was carried out on 22 Nagalintang Elementary School students by dividing them into two groups, namely 11 people as the control class and 11 people as the experimental class.

RESEARCH RESULTS AND DISCUSSION

In determining the location for the initial field test, the researchers used a simple random sampling technique, namely for the small group test at SDN 2 Tenjonagara and the large group test at SDN Sirnagalih. To find out the results of the feasibility test for Interactive E-Module media, it is measured using the following formula:

$$X = \frac{\Sigma X}{n}$$

Information:
X = Average score
$\sum X$ = total score
n = number of respondents

Then the formula for the percentage of results can be calculated using the following formula:

$$\text{Result} = \frac{\text{Total score obtained X 100\%}}{\text{Maximum Score}}$$

Media eligibility categories can be seen in the following table:

Table 1. Media Eligibility

No	Score In Percent (%)	Eligibility Category
1	<21%	Totally Not Worth It
2	21 – 41 %	Not feasible
3	41 – 60 %	Decent Enough
4	61 – 80 %	Worthy
5	81 – 100 %	Very Worth It

(Source: Arikunto in Ernawati, (2017)

The following are the results of the expert validation tests as follows:

Table 2. Media Expert Validation Results

No	Aspect	Question Items	Average Score	Valuation Statement
1.	Efficiency	4	90%	Very Worth It
2.	Appearance	3	81%	Very Worth It
3.	Benefit	3	81%	Very Worth It
Average		**10**	**84%**	**Very Worth It**

Table 3. Linguist Expert Validation Results

No	Aspect	Question Items	Average Score	Valuation Statement
1.	Language used	8	100%	Very Worth It

Tabel 4. Hasil Validasi Ahli Materi

No	Aspect	Question Items	Average Score	Valuation Statement
1.	Format	4	100%	Very Worth It
2.	Contents	3	81%	Very Worth It
3.	Benefit	3	81%	Very Worth It
Average		**10**	**87%**	**Very Worth It**

Based on the results of research conducted by media experts, if we look at it from the efficiency aspect, we get a score of 90%, which is in the very worthy category. Then, looking at the appearance aspect, it gets a score of 81%, which is in the very decent category. Then, looking at the benefits aspect, it gets a score of 81%, namely getting a very decent category. Then the results of the validation carried out by linguists show that from the aspect of the language used in the Interactive E-Module media they get a score of 100%, that is, they get a very decent category, and the results of the validation carried out by material experts, from the format aspect, they get a score of 100%, namely they get the category very worthy. Then, from the content aspect, it got a score of 81%, which is in the very worthy category. Then, looking at the benefits aspect, it gets a score of 81%, namely getting a very decent category. Therefore, the media developed can be used and is suitable for testing. Meanwhile, the results of the validation of test questions carried out by several experts show that the questions that will be used in the pretest and posttest have very valid scores with several improvements. So that the questions used for the pretest and posttest stages are suitable for use. Then the results of the small and large group trials are in the following table:

Table 5. Results of Small Group Trials

No	Aspek	Average Score	Category
1.	Interest to learn	96%	Very Worth It
2.	Use	96%	Very Worth It
3.	Appearance	95%	Very Worth It
Average		**95,6%**	**Very Worth It**

Table 6. Results of Large Group Trials

No	Aspek	Average Score	Category
1.	Interest to learn	96%	Very Worth It
2.	Use	94%	Very Worth It
3.	Appearance	96%	Very Worth It
Average		**95,4%**	**Very Worth It**

The results of small group trials obtained an average score of 96% in the aspect of learning interest, 96% in the aspect of use, and obtained a score of 95% in the aspect of appearance. So it can be concluded that each aspect received a very worthy category. Meanwhile, the results of the large group trial obtained an average score from the aspect of learning interest reaching a score of 96%, namely entering the very feasible category, usage reaching a score of 94%, namely entering the very feasible category, and in the appearance aspect reaching a score of 96%, namely entering the in the very worthy category. Testing effectiveness was carried out using the N-Gain test, namely testing the difference in pretest and posttest averages after using the Interactive E-Module learning media in class V of SDN Nagalintang. The following is the N-Gain formula, namely:

N – Gain = Post test score – Pre test score
Ideal Score – Pre test score

Information:
N-Gain = Normalized Gain
Posttest score= Final test score
Pretest score = Initial test score
Ideal score = Maximum (highest) score

The N-gain value categories can be seen in the following table:

Table 7. Categories of N-Gain Value Gain

N-Gain Value	Category
g > 0.7	Hight
0.3 ≤ g ≤ 0.7	Currently
g < 3	Low

An interpretation of the effectiveness of N-gain can be seen in the following table:

Table 8. Interpretation of the Effectiveness of N-Gain

Percentage (%)	Interpretation Category
< 40	Ineffective
40 – 55	Less effective
56 – 75	Effective enough
> 76	Effective

Source: Meltzer in Ramdhani (2020)

The results of the main field test aim to determine the effectiveness of the Interactive E-Module learning media when used in the learning process. Testing effectiveness was carried out using the N-Gain test, namely testing the difference in pretest and posttest averages after using the Interactive E-Module learning media in class V of SDN Nagalintang. The main field test was carried out using the experimental control group design method where the classes were divided into 2, namely the control class and the experimental class. The results of the control class research showed that the average N-gain score was 0.31 or 31%, with the smallest score being 0 or 0% and the highest score being 0.66 or 66%. Meanwhile, the results of the experimental class research showed that the average N-gain score was 0.8 or 80%, with the smallest score being 0.5 or 50% and the highest score being 1 or 100%.

Discussion

Based on the research results, overall from the development of an Interactive E-Module for Human Digestive System Material, the result was an Interactive E-Module which contained Human Digestive System material. Electronic modules are modifications of conventional modules by combining the use of information technology, so that existing modules can be interesting and interactive. Therefore, researchers are exploring information about E-Modules which can be a learning medium to make it easier for students to understand the material on the Human Digestive System.

The feasibility of the Interactive E-Module learning media was obtained from the results of feasibility test data by experts, namely media, language, material and student responses. The results of the media expert feasibility test are based on known results, that the Interactive E-Module is very good. If we look at each aspect, starting from efficiency, appearance and benefits,

we get an average score of 84% in the very decent category. Then the linguist's eligibility results based on known results including aspects of the language used obtained a score of 100% in the very appropriate category. Then the results of the suitability of the material expert based on the known results of the material presented in the Interactive E-Module, if seen from several aspects, namely format, content and benefits, obtained a score of 87% in the very feasible category and in accordance with the material on the Human Digestive System. Then the results of the student response assessment data are based on the results obtained, that the Interactive E-Module in the aspect of interest in learning can increase students' interest in learning, in the aspect of using learning media it is very easy to use and in terms of appearance it is very good and interesting to use so that from the results of these student responses It is said that this Interactive E-Module is very suitable for use in elementary schools.

The effectiveness test was carried out on 22 Nagalintang Elementary School students by dividing them into two classes, namely a control class with 11 students and an experimental class with 11 students. The results of the control class research showed that the average N-gain score was 0.31 or 31%, with the smallest score being 0 or 0% and the highest score being 0.66 or 66%. Meanwhile, the results of the experimental class research showed that the average N-gain score was 0.8 or 80%, with the smallest score being 0.5 or 50% and the highest score being 1 or 100%. Based on this, the development of the Interactive E-Module, which aims to improve the learning outcomes of fifth grade elementary school students on the Human Digestive System material, has resulted in increased results compared to without using the E-Module. This interactive e-module can also be used for distance learning because it contains complete content and materials so that students can use it independently at home. The researcher's limitation is that this Interactive E-Module must use cellular data so perhaps if it is used in places where network coverage is difficult it will hinder the learning process.

CONCLUSION

Interactive E-Modules are modifications of conventional modules created to improve student learning outcomes. The media feasibility test results were carried out by experts such as material experts, media experts and language experts. Each expert is as follows: material experts give a final score of 0.92 with eligibility criteria of 92% or you could say "Very Eligible", media experts give a score of 0.88 with eligibility criteria of 88% or you could say "Very Eligible", and experts language gives a score of 1 with eligibility criteria of 100% or you could say "Very Eligible". The results of the small group trial obtained an average score of 95.6% with the eligibility criteria "Very Feasible", and the results of the large group trial obtained an average score of 95.4% with the eligibility criteria "Very Eligible". This shows that the Interactive E-Module media is very suitable as a natural science learning medium, especially regarding the human digestive system. At the field research stage, the Interactive E-Module media obtained an average N-gain score of 0.8 in the "High" category and the interpretation category "Effective". Based on the results obtained, the Interactive E-Module was declared feasible and effective for use in elementary schools.

BIBLIOGRAPHY

Daryanto. (2014). *Pengembangan E-Modul berbantuan Kvisoft flipbook maker berbasis pendekatan saintifik pada materi pengorasian aplikasi pengolah kata kelas X OTKP 3 SMKN 2 Blitar.*

Ernawati, I. 2017. *Uji Kelayakan Media Pembelajaran Interaktif Pada Mata Pelajaran Administrasi Server. Elinvo (Electronics, Informatics, and Vocational Education)*

Hamdani. (2015). *Strategi Belajar Mengajar*. Jakarta: Pustaka Setia

Kurniawati, F. N. (2022). *Meninjau permasalahan rendahnya kualitas Pendidikan di Indonesia dan Solusi*. Academy of Education Journal.

Ramdhani, K. F. (2020). *Efektifitas Modul Eletronik Terintegrasi Multiple Representation Pada matei ikatan kimia*. jounal of research and technology.

Sugiyono. (2019). *Metode Penelitian Kuantitatif, Kualitatif dan R&D.* Bandung : Alfabeta.

Sukmadinata, P. D. (2016). *Metode Penelitian Pendidikan.* Bandung: PT Remaja Rosdakarya.

Tukiran, M. (2020). *Pengembangan Sumber Daya Manusia dan Pendidikan dalam Rangka Meningkatkan Pertumbuhan Ekonomi.*