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DEVELOPMENT OF FLIP BOOKMAKER BASED MODULE AS A SUPPORT OF E-LEARNING IN SENIOR HIGH SCHOOL

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Abstract

The progress of science and technology in the era of globalization, especially the era of the industrial revolution 4.0, Affected the use of the internet in the learning process. Conventional learning begins to be integrated with electronic learning or e-learning so that students can learn anytime and anywhere. The purpose of this study is to produce a learning media e-module based on flip bookmakers that is feasible and effective for use in biology subjects at Samarinda City Public High School. The research method follows the Borg and Gall development procedure with 4 main stages, namely 1) pre-development 2) initial development 3) development 4) application.
The results showed that the flip book-based e-module media in biology in Samarinda City High School got an average score of 89.26%, included in the very valid category. The response of students got an assessment of 82.21% included in the very good category. This shows that the e-modules produced are suitable for use in learning. From the pretest and posttest, the gain score is 0.75 in the high category, and the students' score is more than 80% above the KKM, proving the use of e-modules is very effective in learning.

Keywords: *Media e-Module, Flipbook maker. e-Learning, Biology*

The global era which is often referred to as the era of disruption now has a significant influence on learning and can be utilized for the empowerment of students. Teachers need to plan technology-based learning techniques because in the era of the industrial revolution 4.0 workers in all fields are required to have abilities in the digital field. One of the technology-based learning that teachers can do is learning with e-learning(Sagita & Khairunnisa, 2019).

E-learning is not something new to hear, *e-learning* can be interpreted as a learning medium that does not use paper as its material. With the progress of the development of information and communication technology, e-learning can be used as a paradigm of modern education(Nova & Sastrawijaya, 2017). But what happens in the field of e-learning utilization is not maximized in learning at school, there are still many teachers who only use conventional classes without combining with e-learning. There are several obstacles, one of which is that teachers are not yet professional in using internet media and are not ready in making subject matter that can be taught online (Observation data, 2019). Therefore, researchers try to make the development of e-module media to help these problems so that conventional classes and e-learning can be combined.

Professional teachers need to make the best use of learning resources in every learning. This is very important because the effectiveness of learning is also determined by the ability to utilize learning resources. One source of information is the internet(Mulyasa, 2010)therefore it is very important that an educator can create learning media that can be used in e-learning learning. Teachers can provide

materials that are tailored to the learning objectives and make them into electronic form modules (e-modules) so that they can be used in e-learning activities.

Electronic Modules (e-modules) are student self-study materials that are presented in electronic format. Learning in e-modules makes students more interactive because they are connected by various links. E-modules are self-learning materials that are arranged systematically into specific learning units, complemented by the presentation of learning videos, animations, and audio to enrich student learning experiences(Ministry of National Education, 2017), so it is very easy to use by students, making students more active in learning materials and makes it easier for students to understand materials because difficult materials will be accompanied by supporting learning videos.

The use of appropriate learning media can improve students' thinking skills. One of the learning media that is expected to create an interesting learning atmosphere and can be used in e-learning learning is by using e-modules with the flipbook maker application. E-modules using the flipbook maker application will make it easy for teachers and students in learning activities where the e-module media can be used using laptops and mobile phones and can be used while online or offline, students can also learn at any time and anywhere(Sugianto et al., 2013)so that by using e-modules there is no time limit learners can continue learning. This has succeeded the writer to develop a biology module based on the flip bookmaker.

Flipbook Maker is an application that can make pdf files are converted to digital files. By using this application the display file becomes more interesting like opening a book (Ramdania, 2013)By using the flipbook maker tool, the e-module media display will be more varied, making it very easy for students to understand learning material, especially biological material that is abstract, the explanation of the material can be strengthened with an explanation of the learning video to facilitate students' understanding. This is very helpful in the study of biology, especially in terms of genetic substance, activities that occur in very small cells can be explained with the help of learning videos.

(Sudjana. N, 2010) states teaching will be more effective if the objects and events that become teaching material can be visualized realistically like the actual situation. The selection of e-modules can also help the teacher in presenting visualization that is close to reality, students learn the material and watch the learning videos contained in the e-module.

In this study, e-modules were developed using the Flipbook Maker Professional application version 2.4.9.31, in biology class XII Science. The final e-module can be saved to Html, exe, zip, screen saver, and app formats. The use of e-module media with the flipbook application is expected to provide new experiences in the learning process, so that learning becomes more enjoyable and improves student learning outcomes and achievements. The use of Flipbooks can also increase understanding and improve student learning outcomes(Syarif Hidayatullah, 2016), by using e-modules based on flipbook maker learning in schools which are currently still largely conventional in nature can be combined with e-learning so learning is more advanced and varied.

The purpose of the study is to produce e-module learning media based on flip bookmakers that are feasible and effective to be used in biology subjects at Samarinda City Public High School.

METHOD

This type of research is research and development, following the Borg and Gall development procedures that aim to make the development of e-modules in learning biology. The population in this study were all high school students in the city of Samarinda. The samples in this study were participants in SMAN 15, SMAN 11, and SMAN 5 Samarinda City. Research in class XII MIPA SMAN 15 for the trial phase, XII Science in SMAN 11 For research in the field test phase, and in XII MIPA SMAN 5 for the application phase.

Development procedure stated by (Borg WR & & Gall, 1983)consists of 10 (ten) steps, namely (1) research and information collecting, (2) planning, (3) developing preliminary forms of product, (4) preliminary field testing, (5) main product revision, (6) main field testing, (7) operational product revision, (8) operational field testing, (9) final product revision, (10) dissemination and implementation. In this study, it was modified into 4 main stages which did not reduce product development procedures. The 4 stages are: 1) pre-development 2) initial development 3) development 4) application

The validation results were obtained through validation from 3 validators consisting of 1 Material expert lecturer, 1 Language expert lecturer, and 1 media expert lecturer. The validation instruments in this study were in the form of material validation sheets, language validation sheets, and media validation sheets.

Validity assessment is carried out using a Likert measurement scale by responding to the category of very feasible, feasible, fairly feasible, improper, and not very feasible. The validator rating scale is shown in table 1.

Table.1 Range of percentages and qualitative criteria for media validation testing by a team of experts

Value Scale (100%)	**Scale Value (100%) Criteria**
<21%	Very improper
21 - 40%	Not feasible
41 - 60%	Decent enough
61 - 80%	Worthy
81 - 100%	Very decent

source: (Arikunto, 2009)

The trial instrument in this study was used to obtain the feasibility of using e-modules. The instrument is filled in by students after carrying out learning by using e-modules. Assessment of student responses using a Likert scale by responding with very good, good, good enough, not good, and not good assessment categories as presented in table 2. Analysis of student responses was calculated using the formula:

$$P = \frac{F}{N} \times 100\%$$

Information:
P = Percentage score
F = Number of scores obtained
N = Maximum number of scores

Percentage Range	**Category**
81% - 100%	Very good
61% - 80%	Good
41% - 60%	Pretty good
21% - 40%	Not good
0% - 20%	Not good

The effectiveness of e module analysis was developed using data obtained from the pretest and posttest scores. Analysis of students' pre-test and post-test scores is in the form of gain score analysis and comparison of post-test with the minimum completeness criteria (KKM).

The Personalized Gain Equation (Sundayana, R, 2014: 15) can be written as follows:

$$\text{Normalized Gain (g)} = \frac{\text{Post test score - Pre test score}}{\text{Ideal score - Pre test score}}$$

RESULTS

E-modules designed and developed based on the results obtained from the initial observation stage to the final stage (application). To adjust what students need to have developed, then validation is done 2 times. Validation is done namely the validation of the material validation Language and media validation. Validation was carried out by 3 lecturers from the Teaching and Education Faculty of Mulawarman University Samarinda. The validator will provide suggestions, criticisms of the developed electronic modules. Validation is performed until the validator states that e-*module* has been used without revision.

1. Eligibility Results for e-Modules by the Expert Team
   a. Material Expert Validation

   In the initial stage of material validation, based on the questionnaire given, the validator suggest: a) The e-module material is adjusted to the competencies that will be mastered by students, b) The material presented must follow the renewal of knowledge, c) The completeness of the material must be following the abilities of students, d) Add examples of questions that are following the objectives and can be measuring the competency of student success. The results of the initial stage of material expert validation can be seen in Table 3 below.

Table 3. Validation of early-stage material experts

Indicator	**Value percentage (%)**	**Assessment**
Relevance	79.1	Valid
Material accuracy	68.7	Valid
the completeness of the dish	75	Valid
basic concepts of matter	75	Valid
Suitability of the dish	81.2	Valid
percentage value	76.5	Valid

After all the suggestions from the validator have been corrected, the validator of the second stage of the material validation states that the electronic module is feasible and can be used. The results of the validation of the Phase II material experts can be seen in the following table.

Table 4. Validation of stage II material experts

Indicator	**Value percentage (%)**	**Assessment**
Relevance	100	Very valid
Material accuracy	93.7	Very valid
the completeness of the dish	100	Very valid
basic concepts of matter	100	Very valid
Suitability of the dish	87.5	Very valid
percentage value	95.3	Very valid

   b. Validation of Linguists

In the early stages of language validation, based on the questionnaire given, the validator suggests: a) Adding sources to each picture in the e-module b) Writing e-modules according to the level of development of students c) More details to facilitate understanding of the information provided. the results of the validation of the early stage linguists can be seen in Table 5 below.

Table 5. Validation of early-stage linguists

Indicator	**Value percentage (%)**	**Assessment**
Material / Content	75	Valid
Communication, Interactive Dialogue	83.3	Very valid
Suitability of student development	87.5	Very valid
Suitability of language rules	75	Valid
Value percentage	80	Valid

After all suggestions from the validator have been corrected, in the second stage of language validation, the validator states that the e-module is feasible and can be used in learning. The results of the validation of stage II linguists can be seen in Table 6 below.

Table 6. Validation of stage II material experts

Indicator	**Value percentage (%)**	**Assessment**
Material / Content	100	Very valid
Communication, Interactive Dialogue	91.6	Very valid
Suitability of student development	100	Very valid
Suitability of language rules	100	Very valid
Value percentage	97.5	Very valid

2. Media Expert Validation

In the initial stage of media validation, based on the questionnaire given, the validator suggests: a) Using proportional letters and image sizes, b) Making a description for each image, c) Making a way to use buttons on the e-module, d) Using color gradations, e) Looking for animations and videos that match the material. The results of the validation of the linguist phase I can be seen in Table 7 below.

Table 7. Validation of stage I media experts

Indicator	**Value percentage (%)**	**Assessment**
Virtual Communication	70	Valid
Technology	75	Valid
Value percentage	71.2	Valid

After all the suggestions from the validator have been corrected, in the second stage of the media validation, the validator states that the e-module is feasible and can be used in learning. The results of the validation of stage II media experts can be seen in the following table 8.

Table 8. Validation of stage II media experts

Indicator	Value percentage (%)	Assessment
Virtual Communication	75	Valid
Technology	75	Valid
Value percentage	75	Valid

2. Eligibility Results for e-Modules by Students

The results of the assessment of students' responses consisting of aspects of learning materials, engineering of teaching materials, and visual communication.

The following is the distribution of the frequency of students' assessment of the final product e-module media as seen from the aspects of learning material can be seen in Figure 1 below.

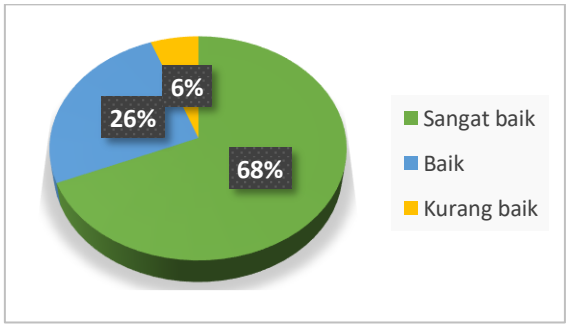

Figure 1 Distribution of the frequency of students' responses to aspects of learning materials.

The percentage distribution of students' response frequencies for engineering aspects of teaching materials can be seen in Figure 2 below.

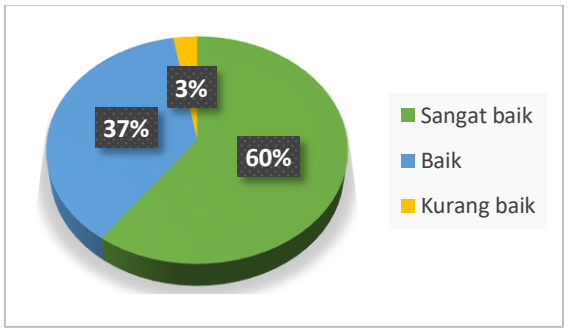

Figure 2 Distribution of the frequency of students' responses to the engineering aspects of teaching materials.

The frequency distribution of students' responses to visual communication can be seen in Figure 3 below.

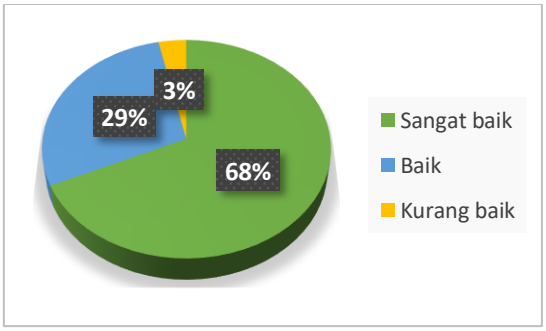

Figure 3 Distribution of the frequency of responses to aspects of visual communication.

3. E-Module Media Effectiveness Test Results

E-module effectiveness test data obtained from the increase in scores (scores) of students before and after using the e-module learning media for genetic substance material. The test questions used by students in the effectiveness tests are consulted to the material expert first. The effectiveness of e-modules can be seen from the results of the pretest-posttest in the trial and application.

The effectiveness of the test data obtained from the testing and application stages can be seen in the following table 10.

Table 10 Test the results of the effectiveness of the piloting and implementation stages

No	Step	Pre Test Rate	Average Post Test	Gain Index	Category
1	Limited Trial	29.72	79.00	0.70	Is
2	Field Trial	31.66	81.57	.73	High
3	Application	32.35	83.10	0.75	High

From the above data, it can be seen that the increase in the gain index score at the trial and application stages from moderate to high. With the increase in the value of the gain score index shows success in learning activities by using e-module media. So that it can be concluded that learning by using e-module media can make learning effective for students. To reinforce this, a review of the students' posttest scores was carried out whether they met the Minimum Mastery Criteria (KKM) or not. The distribution of students' post-test scores on the KKM scores can be seen in the following table 11.

Table 11. Frequency Distribution of Student Post Test Values Against KKM Value

Criteria	Limited Test	Field Trial	Application
Not Meet KKM	3	2	0
Meet the KKM	19	31	35
Total students	22	33	35
KKM Percentage Not Meeting	13.6%	6.10%	0%
KKM Percentage of Meet	86.4%	93.9%	100%

DISCUSSION

1. Feasibility by a team of experts
   a. Material Expert Validation

The quality of e-modules in the material aspect shows that the initial product e-modules get a percentage value of 76.5% with a decent category and the final product has a very decent category with a percentage of values of 95.3%.

The feasibility of e-modules in terms of material shows the accuracy and completeness of the delivery of genetic material in the e-module media. The material presented is following the learning objectives to be achieved, the material is presented in-depth and relevant to current scientific developments. Submission of materials following the level of student development and curriculum so that according to the needs of high school students, offerings in e-modules can also foster student curiosity. this result is following the opinion(Wahono, 2005) where the evaluation of e-module media in terms of material includes conformity with learning objectives, theoretical correctness, accuracy in the use of terms, and depth of material.

   b. Language validation expert

The quality of e-modules in the Language aspect shows that the initial product e-modules get a percentage value of 80% with a very decent category and the final product has a very decent category with a value of 97.5%.

The feasibility of the e-module in terms of language shows that the language used in the e-module is easily understood because it has used the Indonesian standard with the ability to motivate students, able to encourage students to think at a high and creative level, the structure of sentences that is appropriate and effective following the student's intellectual and emotional development. This is following (Yastini et al., 2018), because language is communicative, so language is one way to express ideas or ideas, by using good language we can convey messages to others as well.

The language in the e-module makes students able to understand the messages and information to be conveyed by the teacher, so that they can motivate students to learn more about the genetic substance material. With e-modules students are also able to think at a high level if in the e-module there are hot questions that are adjusted to the intellectual development of students.

c. Media validation

The quality of e-modules in terms of media in the initial product gets a 71.2% percentage value with a decent category and the final product has a decent category with a percentage value of 75%.

The quality of e-modules in terms of visual communication shows that the size, type, and color of the letters on the media are well presented. attractive colors and the suitability between the background and writing as well as the suitability between the material, pictures, and videos in it, will make this e-module media one of the media that can be used for online classroom learning that can attract students' attention. This is following (Ramdania, 2013) that is learning by using a variety of media applications, will make the learning process that students like and fun. Applicative media should not only contain reading text but also be supported by interesting learning videos, audio, and images.

The quality of e-modules in terms of material, language, and media has increased in value along with the inputs and revisions made to produce a quality e-module that is very suitable for use in learning activities.

2. Eligibility of e-Modules by Students

The results of the assessment of students' responses consisting of aspects of learning materials, engineering of teaching materials, and visual communication. Learning material aspects consist of the suitability of the material with basic competencies, the renewal of the material, the presentation, and the suitability of the material with the questions. The engineering aspect consists of three items namely ease of use of e-modules, can help facilitate the delivery of teaching materials, and make learning more enjoyable. The aspects of visual communication consist of three items, namely creative and innovative, clarity of design, and the attractiveness of the e-module design.

Student assessment of e-modules from material aspects with a very good assessment that is equal to 68.6%, good at 25.7%, students state that the material e-module media is following basic competencies and learning objectives, the material is quite easy to understand, and the questions given are following the learning objectives. the assessment is not good at 5.7%, thus it is concluded that the e-module media material is following the basic competencies and learning objectives, the material follows the renewal of science, the material is quite easy to understand, it's just that some materials must be guided by the learning video, and the questions given are following the learning objectives.

Student's assessment of e-modules in terms of engineering teaching materials with a very good assessment that is equal to 60%, 37.2% good, and 2.8% less good. So it can be concluded that the e-module media is very easy to use, makes learning fun and the developed e-module media can provide ease of learning for students, so students can learn anytime and anywhere, also makes learning more enjoyable so that students will easily start learning and get maximum results.

Student's assessment of e-modules from the aspect of visual communication with an excellent rating of 68.6%, both 28.6% and 2.8% less good so it can be concluded that the e-module media in terms of the developed visual education can make active and creative learners in the learning process of genetic substance, to facilitate students in understanding the material, e-modules also make students interested in doing the learning process, students can develop their knowledge and can repeat learning for those who don't understand because by using e-modules can train students' creative thinking skills.

3. E-Module Media Effectiveness Test Results

In the limited trial, the gain index score is categorized as moderate with a value of 0.70 and at the time of the field test, the gain index score is categorized high with a value of 0.73. at the application stage as a result of the effectiveness of the test the gain index value of 0.75 is considered high. With the increase in the value of the gain, the score index shows that learning activities using e-modules work well. So it can be said that the use of e-module media is effective in learning activities. To reinforce this, it is necessary to review the students' post-test scores whether they have met the Minimum Mastery Criteria (KKM) or not.

From the results of the percentage frequency distribution of students' post-test scores, it can be seen that from limited trials to the application of the percentage of students who meet the KKM scores tend to be high, ie above 80% although there are still students whose grades have not yet reached the KKM in limited trials and field trials, at the implementation stage all students meet the standard values above the KKM. So it can be concluded that learning by using e-module media is very effective in using biology learning with evidence of a high gain index score and posttest scores of students who meet the minimum completeness criteria above 80%.

CONCLUSION

Based on the results of research and discussion, it can be concluded, me-modules developed can already be said to be very feasible to use in learning activities by looking at the value of the validation team with an average value of 89.26%, and student questionnaires with an average value of 82.21%.

The e-module media developed is very effective in using biology learning by looking at the results of the student's pretest-and-posttest gain score index on the product application of 0.75 which is categorized as high, and the percentage of students' scores from trials to applications reaching KKM of more than 80%.

REFERENCES

Arikunto, S. (2009). *Research Procedure A Practical Approach revised edition 6.* Renika Cipta.

Borg WR &, & Gall, MD (1983). *Educational Research. Introduction.* fourth edition. Longman

Ministry of National Education. (2017). *A practical guide to compiling e modules.* Directorate General of Primary and Secondary Education.

Mulyasa (2010). *Becoming a Professional Teacher Creates Creative and Enjoyable Learning.* PT.Remaja Rosdakarya.

Nova, AS, & Sastrawijaya, Y. (2017). *Design of Moodle-Based E-Learning Implementation in Statistics Courses Computer Science and Informatics Education Study Program Available at Available at Smart, 1 (1).*

Ramdania. (2013). *The Use of Flas Book Media in Learning Information and Communication Techniques to Improve Student Learning Outcomes.* Final Project Article.

Sagita, M., & Khairunnisa. (2019). *Utilization of e-learning for educators in the digital age of 4.0.* JSH, 2 (2), 35–41.

Sudjana. N. (2010). *Research Teaching and Learning Outcomes.* Rosdakarya.

Sugianto, D., Abdullah, AG, Elvyanti, S., & Muladi, Y. (2013). *Virtual Module: Multimedia FlipBook Basic Digital Engineering.* INVOTEC, IX (2), 101-116.

Syarif Hidayatullah, M. (2016). *Development of learning media based on flipbook maker in basic electronics subjects at SMK Negeri 1 Sampang.* Electrical Engineering Education, 05, 83–88.

Wahono (2005). *Introduction to e-learning and its development.* LIPI.

Yastini, YN, Nurdian, AR, & Wikanengsih. (2018). *Ability to Use Standard Language of Indonesian Language Study Program Students of IKIP Siliwangi. Indonesian Language and Literature Education*, 1 (4), 475–480.