



Development of Circular Motion E-Module Using *Canva* in Physics Subjects in High School

Aisyah Dewi¹, Lukman Hakim², Linda Lia^{3,*})

^{1, 2, 3}) *Physics Education, FKIP, PGRI Palembang University*
Jl. Jend. A. Yani Lrg. Gotong Royong 9/10 Ulu, Kota Palembang, Sumatera Selatan, Indonesia

*e-mail Correspondence: lindalia@univpgri-palembang.ac.id

Article Info: Abstract

Sent:
29 Dec 2021
Revision:
21 March 2022
Accepted:
11 June 2022

Keywords:

Circular Motion,
Canva App, E-Modul

The purpose of this research is to develop circular motion e-modules using Canva in high school that are valid and practical and have a potential impact on learning outcomes. The research is product oriented with Rorntree. There are three phases in this research, namely planning, development, and evaluation. Evaluation uses Tessmer formative evaluation. The instruments used are walkthroughs, interviews, questionnaires, and tests. This study involved 37 students. The e-module product was declared valid by experts who obtained an average score based on the material aspect 3.67 very valid category, design aspect 3.67 very valid category, language aspect 3.67 very valid category, and media aspect 3.48 very valid category. The e-module product scored an average percentage of 90% in the very practical category at the one to one and 84% in the very practical category at the small group. The field test got an average pretest score of 64.42 in the good category and posttest 91.73 in the the n-gain of 0.74 students in the high category. Thus, the conclusion obtained is that the circular motion e-module product using the Canva is suitable for use in learning.

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INTRODUCTION

Students sometimes lack an understanding of all subjects, but what most students complain about is learning Physics. Physics is also found in daily activities, from children to adults, when doing activities and when moving body organs. Learning that is still teacher-centered is one of the obstacles faced by students, so that students do not understand how the discovery process of physics concepts is[1].

Physics is very synonymous with long formulas and even sometimes complicated answers that make students bored to study physics lessons. Especially when learning is now in a state of the Covid-19 pandemic where many students are required to only learn by relying on explanations in the form of videos and reading books. This causes students to become confused about how to elaborate and understand the lessons from the material to be studied. The ability to elaborate can foster students' reasoning [2]. At the time of Covid-19 now there are many schools that still don't know that teaching physics must provide material clearly and precisely so that those who initially don't understand make students understand learning so that teachers play an important role in the success of learning and determine the success of students' learning. That is why the teacher must be able to sort out the learning resources that will be taught to students in the [3].

The learning style of students greatly influences the teaching and learning process, differences in learning styles and the character of students support understanding of the material. Therefore, what is needed at this time is a teaching material that is able to provide facilities or a learning process so as

to foster the ability and interest in learning in children so that they quickly capture understanding quickly [4]. Learning media is a teacher's tool in the learning process, making it easier for teachers to transfer material to students [5]. Especially in this pandemic period, teachers are required to have learning media that are able to support children's learning performance so that students are able to master the material that will be taught by the teacher.

The application of media in the learning process that uses technology is currently the most needed source of learning for teachers and students [6]. So that the use of media is in accordance with the learning objectives and can be used properly, it must pay attention to the techniques of making media [5]. Therefore, during the current pandemic, a teacher is required to teach creatively and be able to create interesting teaching materials so that students understand what they are learning. i.

Teachers can teach physics material and build students' creativity by using e-modules. Not only that, the teacher can also help students make scribbles on the material to be explained, for example, the answer sheet will be sent by the teacher using an invitation from the Canva application. E-modules are in the form of teaching materials that have the characteristics of the material being taught and have been packaged in a unified whole and systematically arranged to be studied independently and more effectively according to the speed and ability of students without guidance from the teaching teacher [7]. So that it can make students understand the learning that has been conveyed and if the learning can be conveyed properly then students are required to be able to express and be able to build student creativity as a form of understanding that has been taught by the teacher.

Research related to the use of e-modules in learning, was reported by (Dewi & Lestari), which showed that the results of the application of e-modules. In addition, (Dewi & Lestari) also reported that the results of material expert validation and multimedia validation showed very good [9]. Based on what has been described above, we have understood that it is very important to conduct research on circular motion e-modules using the Canva application. This study has the following objectives: (a) to develop e-module a circular motion Canva a valid (b) to develop e-module application Canva : and; (c) to find out the potential impact of e-module the circular motion Canva on student learning outcomes.

RESEARCH METHOD

The type of research used is development research (Development Research) from Akker. The development model uses a Rowntree product-oriented. The following is a schematic drawing of the Rowntree. Jenis penelitian yang dipakai adalah penelitian pengembangan (*Development Research*) dari Akker. Model pengembangan menggunakan model Rowntree berorientasi pada produk berupa e-modul yang menggunakan aplikasi canva pada materi gerak melingkar. Berikut gambar Skema tahapan model Rowntree.

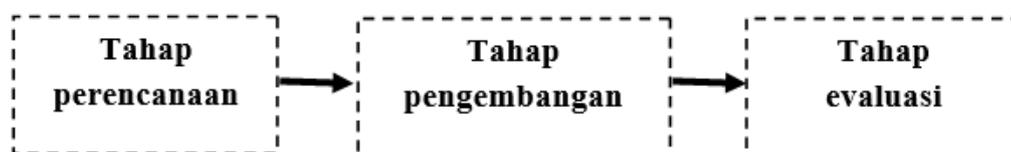


Figure 1. Model Stage Schematic Rowntree

Based on Figure 1, there are three phases of the Rowntree: planning, development, and evaluation. The planning stage includes analyzing the needs of students, analyzing the syllabus, determining the material, setting learning objectives based on the curriculum, collecting examples of e-modules. At the development stage, draft e-modules (scripts) and e-modules were made using Canva (prototype). The Tessmer formative evaluation used in the evaluation phase has 5 phases. These phases are self evaluation (self evaluation), expert reviews (expert validation), one to one, small group (small group), and field test (field test) [10].

This study involved 37 students of class X at SMA 8 Palembang which were divided into three stages, namely the one to one 3 students, the small group 8 people, and 26 people for the field test. Data collection techniques used in this study include: walkthroughs, interviews, questionnaires, and

tests. Interview by interviewing physics teacher at school. Questionnaires are used during expert validation (expert reviews), one to one, and small group. The test is used to determine the potential impact of e-modules on student learning outcomes. The data that has been obtained from the walkthrough on e-module will be analyzed descriptively quantitatively [11]. The validation sheet in the form of a Likert that has been assessed by the expert is then calculated the score so that the category is obtained at the expert validation stage. Analysis of student response questionnaire data at the one to one and small group was analyzed descriptively quantitatively in percentages. questionnaire in the form of a Likert that has been filled out by students is then calculated to obtain the value category from the questionnaire.

Analysis of test results from giving pretest and posttest at the field test form of multiple choice items using equation 1 [12].

$$Value = \frac{\text{obtained score}}{\text{max score}} \times 100\%$$

At the field test calculation is also carried out n-gain. The n-gain can be determined using equation 2 [12].

$$g = \frac{\text{final test score} - \text{early test score}}{\text{maximum score} - \text{initial test score}}$$

RESULTS & DISCUSSION

The research that has been conducted at SMAN 8 Palembang class X IPA is located on Jl. Defense III Seberang Ulu District II Kel. 16 Ulu in Palembang City, South Sumatra. The stages of development research using the Rowntree. The planning stage includes analyzing the needs of students, analyzing the syllabus, determining the material, setting learning objectives based on the curriculum, collecting examples of e-modules. Based on the initial analysis, students of class X science have different criteria, characters, and levels of learning. Based on the syllabus analysis, the research used KD 3.6 and KD 4.6 in accordance with the applicable curriculum. The material made in the e-module is circular motion.

The development stage is making drafts of e-modules covers e, introductions, table of contents, learning objectives, activity instructions, materials, summaries, practicums, exercises, and references. After that, make the e-module using the Canva production prototype). Tessmer's formative evaluation is carried out after the e-module is completed in the development stage. The following is an example of a change in the self-evaluation stage in the formative evaluation phase.

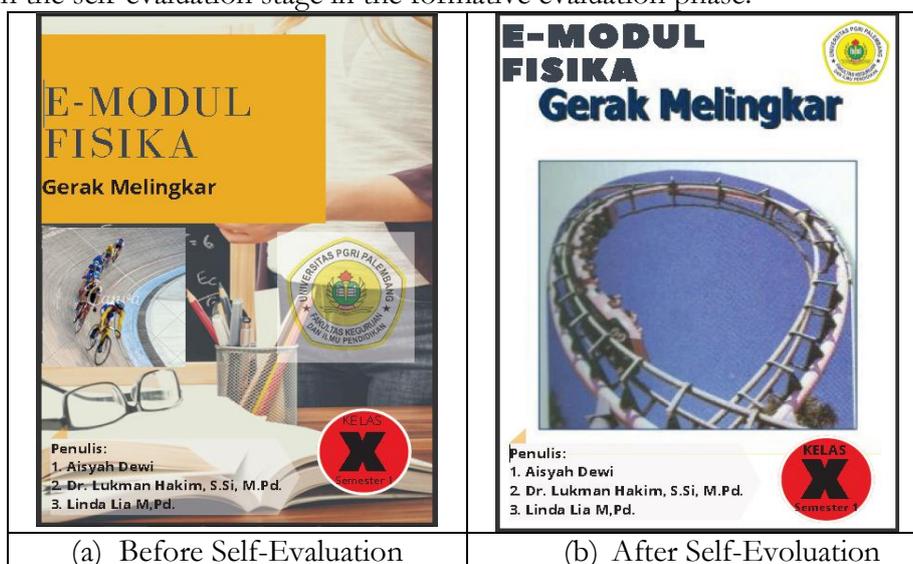


Figure 2. Change Self-Evaluation Evaluation Results

Figure 2 above shows several views e-modules application-assisted Canva that have been revised by self-evaluation.page display image cover because the colors used are too flashy and the picture is not suitable so that it is too crowded with the conditions in the picture. Therefore, the researcher made a simple picture that could be seen in an interesting way by students and was the same as the concept of circular motion.

The expert review focuses on 4 aspects: material, design, language, and media aspects. Based on the results of the expert validation sheet, data is obtained as shown in table 1.

Table 1. Average Expert Validation Results

Measured Aspects	Validator Assessments Result			Average
	V1	V2	V3	
Material	3,13	3,88	4	3,67
Design	3	4	4	3,67
Language	3	4	4	3,67
Media	3	3,43	4	3,48
Average			3,62	
Category			Very valid	

Based on table 1 data, the average obtained for the material aspect is 3.67, the design aspect is 3.67, the language aspect is 3.67, and the media aspect is 3.48. So that the e-module assisted by the Canva obtained an overall average of 3.62 which is categorized as very valid. Therefore, the e-module product developed by this researcher deserves to be revised and tested according to the validator's suggestions. After the product is made, it is necessary to expert review which must be corrected by experts so that the product can be categorized as valid and suitable for use by students [13].

Other researchers who carry out expert validation for e-module products get validation results with an average of 0.84 with a valid category [14]. The results obtained in this study are not the same but the results obtained are higher.

stage one to one the questionnaire data collection involved 3 students. The following is table 2 of the results of the assessment at that stage.

Tabel 2. Evaluation Results One To One

Subject	Score (%)	Category
A	88	Very Practical
B	96	Very Practical
C	86	Very Practical
Average Total	90	Very Practical

Table 2. illustrates the results of one to one in the very practical category because it gets a score of 90%. Comments received from students are in the form of e-modules that are easy to understand, clear, and interesting.evaluation stage small group involves 8 students. This stage aims to assess the practicality of the emodule product. Table 3 is the results of student questionnaires on e-modules assisted by the Canva.

Tabel 3. Evaluation Results Small Group

Subject	Score (%)	Category
D	100	SP
E	76	SP
F	100	SP
G	72	CP
H	84	SP
I	84	SP
J	82	SP
K	74	CP
Average Total	84	SP

Table 3 shows that SP is a very practical category and CP is a fairly practical category. The total number obtained an average of 84% in the very practical category (SP). Some comments from students for the e-module are shown in table 4 below.

Tabel 4. Comments on *Small Group*

Subject	Comments	Desc.
D	The various forms of writing and animations presented make the e-module interesting to read.	No revision
E	The form of the text is very interesting, but in writing the questions may be bolded again.	Revision
F	materials and animations used are interesting.	No revision of
G	E-modules presented is self-explanatory.	No revision
H	The writing on the e-module has been improved again.	Revision
I	The presented E-modules are clear and add color fonts for important points to make them easy to remember.	The revised
J	E-module presented is self-explanatory.	No revision of
K	E-modules presented is self explanatory.	No revision

Based on table 4 data, the Canva is valid and practical. E-modules in this study can be used easily, are fun, easy to understand, and are very interesting for students to understand circular motion material. Other research shows that the practicality score of the electronic modules developed is 80.25% which belongs to the practical category [15].

The results of data acquisition at the field test on learning outcomes involving 26 students of class X science are as shown in Figure 3.

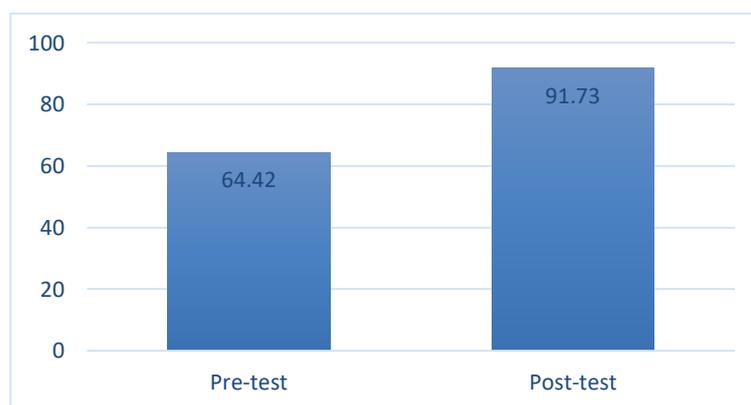


Figure 3. Pre-test and Post-test results at the Field Test

Based on the data obtained at the field test, the average value of the pretest was 64.42 and the posttest was 91.73 so that there was an increase of 27.31. The increase in these results shows that the circular motion e-module assisted by the Canva that was developed can actually improve the learning outcomes of students. The following is a recapitulation of the n-gain.

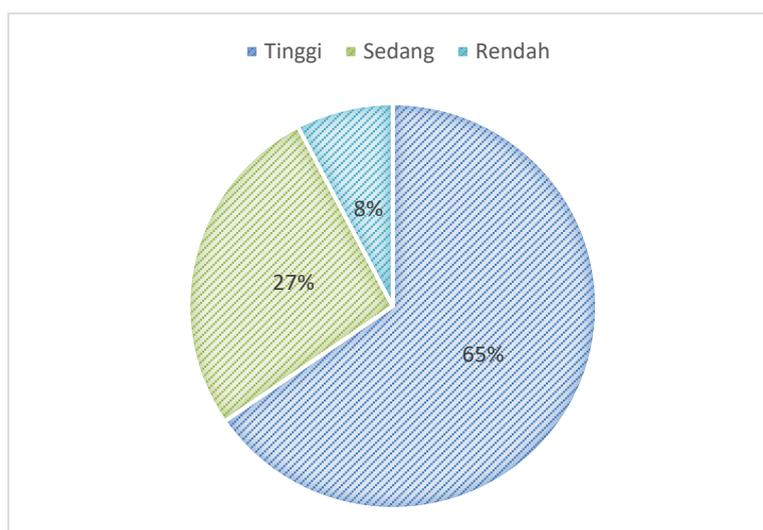


Figure 4. *n-gain* Data

Based on Figure 4 above, 17 people (65%) got the high category, 7 people (27%) got the medium category, and 2 people (8%) got the low category. The result of the *n-gain* 0.74 (high category). Thus, the circular motion e-module product using the Canva is suitable for use in learning. The results of other studies show that the electronic module (e-module) according to the expert is in the appropriate category and the use of e-modules in general can be carried out in a feasible category and gets a positive response from students [16].

CONCLUSION

Based on the results of research conducted at SMAN 8 Palembang class X IPA using circular motion e-module using the Canva, it was found that the e-module product was declared valid by experts by getting an average value based on the material aspect 3.67 very valid category, 3.67 categories of very valid design aspects, 3.67 very valid categories of language aspects, and 3.48 very valid categories of media aspects. This product is stated to be very practical to use with an average percentage score of 90% at the one to one and 84% in the very practical category, at the small group. At the field test, the use of the e-module got an average score of pretest in the good category and post-test in the very good category and the *n-gain* result was 0.74 in the high category.

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