

Development of E-Physics Magazine Media with the Assistance of Canva to Increase Students' Interest in Learning Physics: A Feasibility Test

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Abstract: Learning media is a tool that can assist teachers in conveying information to students so that the material can be conveyed thoroughly. Physics, which is seen as a difficult subject, requires alternative attractive media such as magazines in order to increase interest in reading and learning. The purpose of this research is to determine the feasibility of E-physics Magazine as an alternative physics learning media. The R&D research method is used with the 4D model which is carried out until the development stage. Feasibility test with 3 indicators was conducted by 1 lecturer and 6 active Physics Education students. The results of the feasibility test obtained are the material indicator getting an average result of 3.43, the media presentation indicator getting an average result of 3.08, and the language indicator getting an average of 3.46. So, it can be stated that E-physics Magazine is feasible to use as an alternative physics learning media.

Keywords: E-physics Magazine, Ohm's Law, reading interest, learning interest

Introduction

Reading is important in the world of education to improve understanding of science. One of the problems currently facing Indonesia is interest in reading. Reading interest is a form of someone's interest in reading new insights or knowledge. According to the results of the Program for International Student Assessment (PISA) study by the Organization for Economic Co-operation and Development (OECD) in 2018, students' reading ability obtained an average score of 371 with the average score from the OECD being 487, then science ability obtained an average score of 389 with an average score from the OECD of 489. (Kinasih & Mariana, 2021). Regarding this data, it can be concluded that students' abilities in reading and science need to be improved to at least reach the average OECD score.

Students' low interest in reading can be caused by internal factors, one of which is the lack of internal motivation to be interested in reading. (Afifah et al., 2022) Apart from that, according to Rochmawati in (Afifah et al., 2022) the external

factor that causes the reading crisis is the lack of facilities and infrastructure, such as quality and interesting reading books. Problems related to low interest in reading spread not only to elementary school level but also to tertiary institutions. Conditions like this are very worrying, the low interest in reading of students will have an impact on reducing the level of students' ability to analyze and solve problems related to learning. (Sukirman et al., 2021).

Science is knowledge related to natural laws, physics is part of science. In physics, reading is very necessary to build existing concepts and knowledge, but it appears that students' reading interest in physics is quite low. (Afifah et al., 2022). The low interest in reading is accompanied by the impression that physics is material that is difficult to understand and less interesting among students, which contributes to the low science abilities of students. (Hartati, 2010). In fact, physics is a natural science that is very closely related to phenomena in everyday human life, such as electronics.

In an effort to deal with the perception that physics is a difficult subject, it is necessary to present physics creatively, innovatively, and following

students' lifestyles according to current developments with alternative learning that applies a contextual approach (Nurhasanah et al., 2020). According to Wardani and Wiyatmo, physics learning presented with contextual learning can increase students' interest in learning and learning outcomes. (Wardani & Wiyatmo, 2018). Apart from the contextual approach, there is a need for alternative media such as physics magazines which can increase students' reading interest and learning outcomes because of their simple and interesting delivery (Wati et al., 2021).

Previous research was conducted by (Nurhasanah et al., 2020) on "Application of Physics Magazine Learning Media 'Physicsmagz' Based on Contextual Learning to Improve Science Literacy Abilities" using a quasi-experimental method. The results of this research show that the existence of the physics magazine 'Physicsmagz' can improve students' scientific literacy skills. Research by (Septiana & Rohmadi, 2023) on "Development of Physics Magazines in Islamic Integrated Business and Energy Materials" shows that physics magazines are feasible and can be used as a medium for learning physics in business and energy materials. This research method uses development research with the ADDIE development model.

Based on these descriptions, motivate researchers to conduct research regarding the feasibility of developing physics learning media in the form of electronic magazines that are packaged in a more attractive and modern way using Ohm's Law material by taking advantage of technological advances. This electronic magazine was later called E-physics Magazine with detailed content in the form of a history of the discoverer of Ohm's Law and an explanation of the material followed by facts related to Ohm's Law in everyday life as well as simulations related to basic laws of electronics science. The hope is that this electronic magazine, it can foster students' interest in reading and learning, especially in the field of physics which is closely related to phenomena in everyday life.

Methode

This research uses the Research and Development (R & D) method. The Research and Development method is a research method intended to produce an object that can be seen and can be used. (Diyana et al., 2020). The development model used is the 4D model (define, design, development, and disseminate). In this research, the stages in the 4D model only reached the development stage

because it kept in mind the aim of the research. The research subjects are 1 Physics Education lecturer and 6 5th Semester Physics Education students who will carry out a media feasibility test.

The define stage aims to determine and define the requirements for the learning media that will be used. (Wardani & Wiyatmo, 2018). In this stage, the researcher selects Ohm's Law material and will consist of historical explanations, formulas, simulations, and phenomena regarding Ohm's Law. At the design stage, media development was carried out using the Canva application with an A4 magazine-size design. The initial steps taken are preparing the manuscript, determining the color, determining the font, and determining the magazine icon. The product being developed is equipped with a QR code that can be scanned by students to access materials, simulations, and games. At the development stage, the media feasibility test was carried out by 1 lecturer and 6 Physics Education students with the assessment instrument aspect consisting of material aspects, media aspects, and language aspects. Then the resulting media product will be revised based on comments, suggestions, and assessments from validators.

Result and Discussion

The media development that has been carried out has resulted in a product in the form of an electronic magazine called "E-physics Magazine" containing physics material about dynamic electricity, especially Ohm's Law. The choice of this topic was based on the fact that dynamic electrical material is often encountered in everyday life, so it can introduce students to the fact that physics is closely related to phenomena in life. The target users of this media are students at junior high school and senior high school levels. The developed E-physics Magazine contains 7 sections as can be seen in Figure 1.



Figure 1. E-physics Magazine before revision

The first part is the Introduction containing the basic competencies and goals to be achieved after using learning media on Ohm's Law material. The contents of the objectives in the Introduction are 1) being able to understand the concept of Ohm's law; 2) able to analyze Ohm's law; 3) being able to carry out simulations or practical work on Ohm's law; and 4) able to present simulation or practicum results well and precisely. The second part is History, which contains information about the discoverer of Ohm's Law and the history of his journey until his discovery was recognized by the world.

The third section, Materials contains material on Ohm's Law. The material is presented in language that is often used every day and does not only focus on formulas. This section includes a QR code that can be accessed with a smartphone to view videos related to Ohm's law. The fourth part, Simulation contains a guide to simulating Ohm's Law via Phet. The Phet simulation can be accessed via the QR code or link listed. Phet is a simulation website that is easy to access and very effective in helping students understand concepts related to electronic material. (Sinulingga et al., 2016).

The fifth section is Fun Fact containing facts and phenomena about Ohm's Law which are often related to everyday life. The sixth section, Exercises, contains examples of questions that students can work on. The questions chosen are adapted to the material that has been presented. The final section, Closing, contains crossword games or crossword puzzles related to Ohm's Law and is equipped with a crossword QR code. The crossword game was created using the Wordwall website. Wordwall is an educational game media that is easy to use and is able to create beneficial interactions for students. (Utami et al., 2023). When students work on a crossword game with Wordwall, students will get feedback regarding their answers.

E-physics Magazine about Ohm's Law carried out a feasibility test from 1 lecturer and 6 Physics Education students so that it was suitable to be used as a learning medium. The results of the feasibility test are then used to improve E-physics Magazine so that it is suitable for use as a learning medium. The indicators tested regarding this product are material indicators, media presentation, and language which are explained in detail. The results of the feasibility test analysis for each indicator can be seen in Table 1.

Table 1. E-Physics Magazine Feasibility Test Results

Assessment Indicators	Average Score	Interpretation
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Material Quality	3.43	Very Good
Media Presentation	3.08	Good
Quality		
Language Quality	3.46	Very Good

The interpretation categories in the explanation of each indicator above are in accordance with the provisions in Table 2 below.

Table 2. Interpretation categories

Score Range	Interpretation
3.24-4.00	Very Good
2.44-3.20	Good
1.64-2.40	Enough
7.00-1.60	Not Good

Based on the analysis results in Table 1, the average rating for each indicator shows very good qualifications for material and language as well as good qualifications for media presentation. These results indicate that E-physics Magazine is worthy of being developed as a learning medium to increase students' reading and learning interest in physics subjects.

Material indicators are assessed with detailed aspects, namely 1) clarity of learning objectives; 2) suitability of material coverage; 3) accuracy of material concepts; 4) clarity and sequence of material concepts; 5) ease of material concept; and 6) the material concept can attract students. Material indicators are important in the development of this media. More clearly, it can be shown in Table 3 for each aspect of the material indicators tested.

Table 3. Material Feasibility Test

Assessment Indicators	Score
Learning objectives are conveyed clearly and appropriately	3,57
The scope of material contained in the magazine is in accordance with KI and KD	3,42
The concept of the material presented is correct	3,00
Material concepts are presented clearly, sequentially and systematically	3,86
The material concepts presented are easy to understand	3,29
The concept of the material presented can attract students' learning interest	3,43

Reviewed thoroughly, the feasibility test indicators for electronic magazine material show that E-physics Magazine is suitable to be applied as a medium to increase students' interest in reading and learning. This is proven by the numbers shown by each aspect reaching a score of more than 3.00 or in

the very good category. The material presented in electronic magazines uses a contextual learning approach that involves students directly in relating the material to real life so that students are able to understand and apply the concepts obtained to everyday problems. (Nurhasanah et al., 2020). The comments and suggestions given on the material indicators regarding writing formulas still look broken or unclear.

Media presentation indicators are assessed using detailed aspects, namely 1) media effectiveness; 2) ease of media; 3) media usefulness; 4) selection of images or illustrations; 5) color combination; 6) letter selection; 7) distance, line, and space settings; 8) image and letter layout settings; and 9) presentation of writing. Media presentation indicators relate to the appearance of the media used in the magazine. Physics requires creative, innovative presentation and following a lifestyle in order to increase students' scientific literacy (Nurhasanah et al., 2020).

Details of aspects of media presentation indicators can be seen in Figure 3. Overall, every aspect tested in the media presentation feasibility test shows that E-physics Magazine is suitable for use in order to increase students' interest in reading and learning in physics lessons. This is proven by every aspect of the media presentation indicator showing a number more than 2.5 or in the good category. It is hoped that the presentation of material in E-physics Magazine by utilizing technology, such as QR codes and the Wordwall website, can increase students' interest in learning. In this indicator, we received a lot of input and suggestions regarding the placement of elements and writing, choosing background colors, adding text shadows, and writing footers.

Table 4. Media Presentation Feasibility Test

Assessment Indicators	Score
Magazine learning media is quite effective in increasing students' interest in learning	3,14
Magazine learning media is easy for students to use independently	3,43
Magazine learning media can make it easier for students to remember the material	3,14
The images or illustrations used in learning media are appropriate and interesting	3,43
The color combination used is appropriate so that the text is easy to read	3,00
The choice of letters in learning media is correct so that they can be read clearly	2,86
The arrangement of distances, lines, and spaces in learning media is regular and organized so that the text is easy to read	2,57
The layout of images and letters is correct	3,14
The writing presented is easy to read	3,00

Language indicators are assessed with detailed aspects, namely 1) ease of language to understand; 2) use of sentences; 3) use of punctuation; 4) presentation of writing; and 5) the use of language can attract students. More clearly, it can be shown in Table 4 for each aspect of the material indicators tested. Language is important in conveying information. The results of the E-physics Magazine language feasibility test in detail can be seen in Table 5.

Table 5. Language Eligibility Test

Assessment Indicators	Score
The language used is easy to understand	3,57
The use and application of sentences are correct so they can be understood	3,29
The use of punctuation marks in the text is correct	3,43
The text presented is easy to understand	3,43
The language used can attract students' interest in learning	3,57

Based on the table above, the language indicator test shows that the language used in electronic magazines is appropriate so that it can be given to students. This is proven by the value of each aspect showing a number more than 3 or in the good category. In this electronic magazine, the language used is non-formal language which is often used every day. The material is delivered by asking questions and providing answers accompanied by facts. The comments and suggestions provided regarding corrections to sentence structure and punctuation as well as simplifying sentences.

Comments and suggestions for each indicator are used as revision material so that the electronic magazine can be used by students independently. The improvements to E-physics Magazine have been carried out according to suggestions. The revised E-physics Magazine results can be seen in Figure 5.

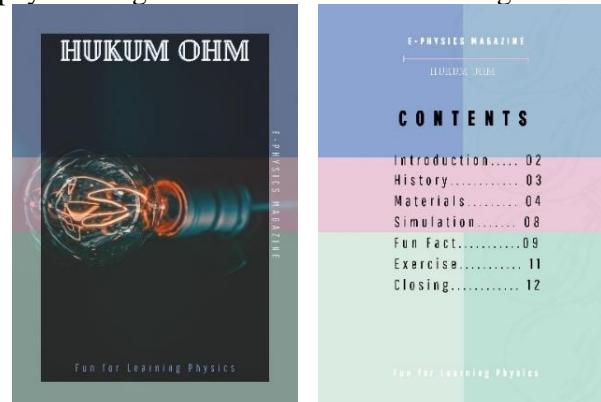


Figure 2. E-physics Magazine After Revision

Based on the discussion above, E-physis Magazine is suitable for use as a learning medium that can increase students' interest in reading and learning. This is in line with research conducted by (Nurhasanah et al., 2020) that physics magazines are suitable for use as learning media and can be used to improve students' scientific literacy skills. Next, the development of E-physis Magazine can be continued to the disseminate stage, namely to determine the effectiveness of electronic magazines as a learning medium for students in the learning process at school.

Conclusion

Based on the results of the feasibility test research that has been carried out, it is concluded that the electronic magazine E-physis Magazine can be used as a physics learning medium. The results of the feasibility test on 1 lecturer and 6 Physics Education students with 3 indicators obtained an average score in the good-very good category. The three indicators are material indicators which get an average score of 3.43 or very good category, media presentation indicators get an average score of 3.08 or good category, and language indicators get an average score of 3.46 or very good category. Apart from the fact that E-physis Magazine is already feasible and can be tested on students, it does not rule out the possibility that it needs improvement. The improvements in question are in the form of more unique material, images, or presentation..

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