Electronic Module With Contextual Approach

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Abstract

The purpose of this research is to create an interactive electrical module product with a contextual approach and to assess the effect of its use on students' learning motivation on conductor and insulator material. The R&D approach is used in this investigation, along with a 4D model. A questionnaire was used as the study tool. The product was evaluated for practicality, material validity, readability, and student learning motivation. Seventh-grade students from MTsN 1 Kota Bandung and five validators participated in the study. The information was examined qualitatively. The study's findings show that the average product score is 3.9 with very good criteria and a percentage of 98% is very feasible, the validity of the material has a score of 3.8 with very good criteria and a percentage of 95% is very valid, the readability test has a score of 3 with very good criteria and a percentage of 75%, and student learning motivation has a score of 3 and a percentage of 100% with high criteria. It is possible to conclude that the contextual approach interactive electronic module influences students' motivation to learn about conductor and insulator materials.

Keywords: Contextual Approach; Electronic Module; Learning Motivation

Introduction

Science education is learning that is relevant to everyday life. Science learning may also be defined as a scientific-related process in which the concepts of the material learned are linked to everyday life in order for learning to be successful and meaningful (Khusniati, 2012). Students' knowledge or content is always tied to real-world facts so that students may apply what they've learned to address difficulties in their daily lives (Marlina et al., 2011). Science learning may be done using entertaining activities so that students can readily comprehend the current topics (Wright, 2001).

Conductor and insulator material is one of the materials used in science classes. This information is still abstract. Conductors are items that can efficiently conduct heat. This item may transport heat in one direction if it is subjected to fire, hot water, or sunshine in one portion. Heatinsulating things are those that transfer heat poorly. When exposed to fire, hot water, or sunshine in one portion, this item cannot or only slowly transfers heat to the other sections (Rosma, 2016). When teachers continue to use the lecture technique (traditional), the lack of learning activities in the process of learning science activities, the subject matter of conductors and insulators, has a poor influence on student learning results. (2019, Silva and Fasha). Learning is teacher-centered, therefore student engagement in learning is minimal, resulting in students being passive and low student learning outcomes (Susanti, 2021).

Motivation is defined as the desire to accomplish something in order to attain a goal (Badaruddin, 2015). Student learning success can be influenced by motivation (Li & Baker, 2018). Junior high school kids are still unmotivated when it comes to learning. Ani Widyawati's research on junior high school pupils demonstrates that scientific learning motivation is poor, with questionnaire

results indicating that 53% of students are bored with science classes. Several research on teaching techniques to promote student engagement have been conducted to tackle the problem of poor student motivation (Cheng et al., 2021). Active learning can influence students' motivation to study (Lan & Hew, 2020).). There must be an incentive for students to participate in their learning so that their learning motivation develops (de Barba et al., 2016).

The creation of guided inquiry learning tools has been done in order to tackle the problem of poor motivation in conductors and insulators (Suwatra, 2018). The use of audio-visual media in scientific learning using an NHT cooperative learning model (Ahaya, 2020) and experimental procedures (Supardi, 2015). There are shortcomings in various studies that have been produced, notably, to overcome students' poor learning motivation on conductors and insulators, which are still confined to devices, techniques, models, and media. As a result, a solution is provided, namely the construction of an interactive-based electronic modul with a contextual approach in order to boost participants' learning motivation .

Electronic modules are packed in the form of content that includes videos, music, and animations and is arranged in a way that allows students to study autonomously (Perdana et al., 2017). Concrete material can be portrayed in videos and animations on electronic modules (Adriani et al., 2021). Electronic modules can boost students' motivation to learn (Syahrial et al., 2020). Electronic modules can improve the learning environment by allowing students to grasp the information being studied, resulting in higher quality learning (Daryanto, 2013; Linda et al., 2020; Wena, 2012) .

The electronic module made must be modern, preferably digital, and may be created with the Flip PDF Professional program and packed in android form. The Flip PDF program offers elements such as photos, movies, animations, YouTube, hyperlinks, and file merging that may be utilized to construct electronic modules (Himmah, 2019). E-modules created using Flip PDF Professional may help students study independently, making it easier for pupils to grasp, and are adaptable since they are based on Android and are not constrained by place or time (Lestari et al., 2022).

A contextual method is a 7-step process that combines content with facts (Sutejo, 2009). It includes constructivism, discovery, asking questions, learning communities, modeling, reflection, and real evaluation. Constructivism is pre-existing knowledge, an inquiry is the knowledge and skills acquired by students, questioning is the activity of asking questions during learning, learning community is collaboration, modeling is an imitated model, reflection is a past and present way of thinking, and authentic assessment is data collection to see the development of learning outcomes (Hamidah et al., 2017). The contextual method implies that students have linked the idea to real-world situations in order to address difficulties (Harwell, 1999). Contextual learning can inspire students to be more optimistic (Suryawati & Osman, 2018). Contextual learning can boost students' motivation to study (Ekowati et al., 2015; Setiawan & Harta, 2014) .

Based on the described problems, a solution is provided, namely the development of an interactive electronic module with a contextual approach to measure students' learning motivation on the topic of conductors and insulators and determine the effect of their use on students' learning motivation on conductors and insulators..

Method

The research approach employed in this study is R&D, which seeks to create a product and assess its practicality and readability (Sugiyono, 2018). The produced product is an electronic module with a contextual approach that is bundled into an android and laptop application with conductor and insulator material as a means of increasing students' learning motivation on conductor and insulator material .

Table 1. Table of Details of Research Stages

Stages	Results

Define	Literature study, guide in making electronic modules and flipbooks
Design	Product drafts, student learning motivation instruments, and assessment instruments for material validation questionnaires, media, and readability tests
Develop	Electronic module application, material and media validation results, test results and learning motivation, and revision results
Dissemination	Product articles and product distribution

This study used a 4D model, which stands for define, design, develop, and disseminate. Table 1 shows the steps of the investigation as well as the outcomes gathered. Figure 1 illustrates the research flow .

The gathered data are quantitative data in the form of material validation surveys, products, readability, and students' learning motivation. Meanwhile, qualitative data is being collected in the form of comments and ideas from validators, instructors, and students. Data were acquired from the findings of material and media validation questionnaires completed by five validators, as well as readability and learning motivation questionnaires completed by MTsN 1 Kota Bandung students. The surveys for readability, motivation, material, and media employ a 4-level Likert scale, namely strongly agree, agree, disagree, and disagree (Likert, 1932). The collected data was then evaluated using the average value analysis approach. As a result, the average value may be calculated as follows (Formula 1).

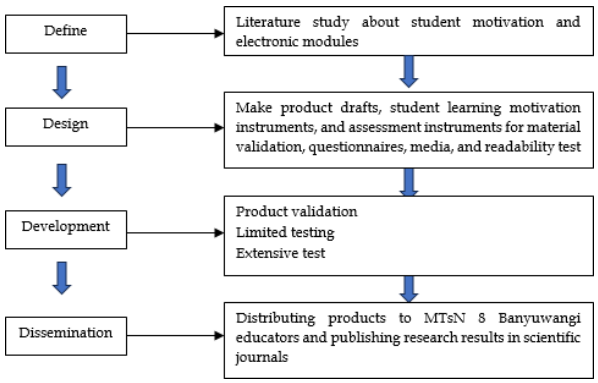

Figure 1. Research Flow

$$P = \frac{\sum R}{N} x\ 100\%$$

Information:
P = Percentage score
R = Total score of answers given by each respondent
N = Total ideal score

Table 2. Table of Eligibility Criteria for Questionnaire Data with a Scale of 4

Quantitative Score Range	Category

X ≥ 3.00	Very good
2.50 X < X + 0.50	Well
2.00 X < 2.50	Not good
X < 2.00	Very Not Good

Then interpret and conclude the data using the percentage of product feasibility. Table 2 shows the parameters used to establish the feasible product, while Table 3 shows the amount of student learning motivation

Score	Criteria
X ≥ x̄ + SD	High
x̄ - SD ≤ X < x̄ + SD	Currently
X < x̄ - SD	Low

In product development and improvement, qualitative descriptive analysis of product feasibility and readability data from validators and students is used .

Result and Discussion

The product produced is an interactive electronic module packed in the form of an android and laptop application with a contextual approach to conductor and insulator material in order to boost students' learning motivation. The creation of electronic modules is one method for making learning more effective and enabling students to grasp the content being studied, resulting in excellent learning (Daryanto, 2013; Linda et al., 2020; Wena, 2012). Electronic modules allow pupils to learn freely (Perdana et al., 2017) . Electronic modules, which are not yet commonly utilized by educators, are one of the novel teaching tools that can assist learning activities, particularly digital-based ones (Prabasari et al., 2021). Starting with the title of the E-Modul, the identification of the electronic module, idea maps, and material subjects that encompass many activities, electronic modules are built in a methodical way. Figures 2a and 2b show the findings of the electronic module

Figure 2a. Home Electronic Module **Figure 2b.** Contents Page of Electronic Module

The subjects provided include various sub-themes ranging from Learning Activities 1 Heat and Specific Heat to Learning Activities 2 Heat and Specific Heat. 2 Learning Activities, Heat Transfer 3 Conductors and Insulators, Activities for Learning 4 Physics Examples in the Touch Sensing System (Skin), which encompasses the sensation of touch in humans as well as function and skin problems. Examples of everyday issues are offered in the form of learning videos, which students may access simply by hitting the play button on the video . It is intended that by using video, learning would become more relevant and tangible (Adriani et al., 2021).

Figure 3. Student Learning Activities

Learning activities are carried out by presenting stimuli to students linked to the content, for example, the instructor asks what students feel when they mistakenly touch a pot on the burner. The pupils are then divided into groups and handed electronic modules that can be opened on laptops and androids. The electronic module is used to facilitate learning. The pupils then do experiments from the electronic module. Prepare three identically sized blocks A, B, and C from various materials, then have students heat the blocks and feel the heat. Then, as an indicator of conductors and insulators, students compare which one spreads heat fastest . When conducting practical identification of conductors and insulators, the contextual approach to electronic modules may be noticed. Students are instructed to light a candle, heat some things, let them sit for a bit, and then contact it with a cloth to feel the heat .

Students in the constructivism level are already familiar with conductors and insulators from prior curriculum and from everyday life. Then, during the inquiry stage, students light a candle and heat several identical blocks A, B, and C made of different materials, then touch the object to see and compare which block heats up faster as an indicator in determining insulator and conductor objects, and finally, students record their findings on a table. During the questioning stage, students respond to the questions prepared in the electronic module. During the Learning community level, students work in groups to complete practical exercises. Students attempt to depict sections of the skin as receptors during the modeling stage. Students relate the outcomes achieved with the preceding information during the reflection step. Students gather the findings of the practicum and the learning evaluation at the end of the electronic module during the authentic assessment stage. The contextual approach is used in this electronic module in accordance with the Ministry of National Education's (Depdiknas, 2003) guidelines, which state that there are seven components in contextual learning: constructivism, which is pre-existing knowledge, inquiry, which is knowledge and skills acquired by students, questioning, which is the activity of asking questions while writing, and writing . Learning, learning community, specifically cooperation, modeling, specifically there is a model that is mimicked, reflection is a way of thinking about the past and present, and authentic assessment is the collection of data to see the growth of learning outcomes (Hamidah et al., 2017).

Active and fascinating learning in learning aids participants in increasing students' learning motivation (Syahrial et al., 2020). The interactive flipbook electronic module with a contextual approach can be utilized to boost students' learning motivation. The product feasibility test was graded by five validators: four Master of Science Education students from Universitas Negeri Yogyakarta and one science teacher from MTsN 1 Kota Bandung. Figure 5 displays a summary of the average product assessment findings.

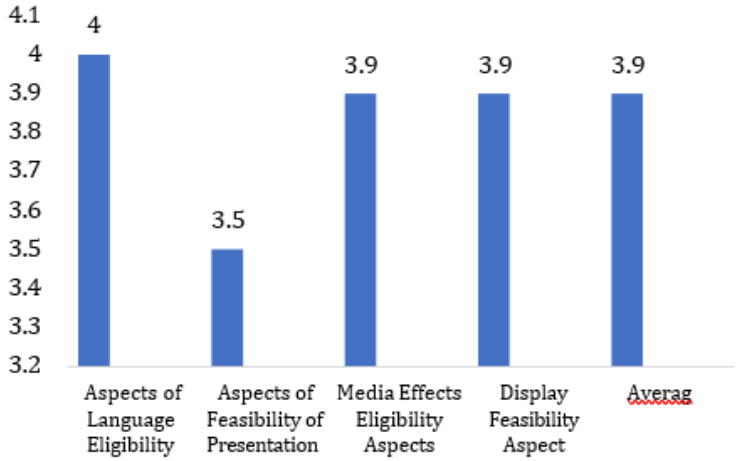

Figure 5. Product Feasibility Average

The product feasibility test results show an average feasibility score of 3.9 for very excellent criterion and a percentage of 98% for extremely viable criteria. Figure 6 depicts a summary of the typical material assessment findings .

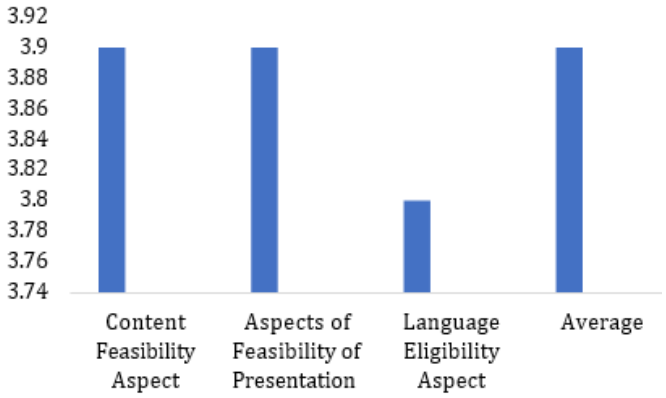

Figure 6. Material Validity Average

The material validity test yielded a score of 3.8 with extremely excellent criteria and a percentage of 95% on average. has extremely valid criteria. As a result, the creation of an interactive electronic module Flip Book with a contextual approach to conductor and insulator material may be utilized as learning material to help increase students' learning motivation .

The electronic module reading test results in quantitative and qualitative data collected from 20 grade VII students at MTsN 1 Kota Bandung. The readability questionnaire ratings and students' learning motivation were used to generate quantitative statistics. The readability test yielded a score of 3 with very good criteria and a percentage of feasibility of 75% with extremely viable criteria. The pupils' learning motivation test results earned a score of 3 and a percentage of 100% with high criterion .

According to the data acquired, the electronic module can influence students' learning motivation on conductors and insulators and can operate as an opportunity to boost students' learning motivation. The effects of this statistics may be demonstrated throughout the learning process, when students are more engaged and ready to learn due to the use of teaching materials that include movies and animations. Students

are also more engaged and motivated while doing experiments with candles and blocks to test conductors and insulators. The validity data findings also reveal that this electronic module is suitable for learning, as evidenced by the total value of validators who are experts in their domains .

This is consistent with earlier research demonstrating that interactive electronic modules may increase students' enthusiasm to learn (Syahrial et al., 2020). Furthermore, the attractive design of the electronic module may increase student learning motivation (Ratnawati & Khaharsyah, 2022). When pupils learn in the classroom, motivation is critical. Motivation is extremely important while students study in the classroom since it impacts students' skills and learning results (Hidayati et al., 2022; Syamsinar et al., 2023). Videos and animations on electronic modules can depict concrete material (Adriani et al., 2021). Animation may show how abstract ideas can be transformed into concrete concepts (Castro-Alonso et al., 2019). According to study, using animation to teach scientific subjects can increase students' knowledge and understanding (Dalacosta et al., 2009). The use of animated films in electronic modules has been shown to boost students' learning of science (Hanif, 2020; Hapsari et al., 2019; Ploetzner et al., 2020) . The existence of animation can also increase students' understanding , because motivation will influence students' skills and learning of science material (Hobban & Nielsen, 2013).

The module has the benefit of allowing students to determine the amount to which they can absorb the content (Arviyanto Himawan et al., 2020; Liana et al., 2022). Learning may be carried out efficiently if electronic modules are used to meet learning objectives (Rasmi et al., 2023). This study is substantiated by studies indicating that students today prefer studying via cellphones with electronic modules (Arviyanto Himawan et al., 2020). The findings of this study agree with those of Ndoa and Jumadi (2022), who contend that the usage of electronic modules might boost students' learning motivation.

Contextual learning can inspire students to be more optimistic (Suryawati & Osman, 2018). Contextual learning can boost students' motivation to study (Ekowati et al., 2015; Setiawan & Harta, 2014). Contextual learning can drive pupils to study (Rahmatullah et al., 2023). Contextual model learning may give students with fresh experiences that encourage the brain to build connections between events, allowing them to acquire new meaning (Ningrum & Murti, 2023). Contextual analysis is used to find solutions to unsolved problems or to better comprehend something (Milanto et al., 2023).

Conclusion

Based on the findings, it is possible to conclude that the interactive electronic module contextual approach can boost students' learning motivation. Recommendations for future study can be produced again and used as a learning support medium.

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