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Review of The Practicality of Physics Teaching Materials on Optical Devices Material That Is Loaded With Al-Quran Verses

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Abstract

This research is a Research and Development (R&D) study to obtain feasible teaching materials containing Quranic verses that provide information on practicality in learning. This study aims to determine the practicality of teaching materials based on the level of readability of teaching materials for optical devices with Al-Quran verses that were developed. This research is research and development using the ADDIE model and was tested on 42 students of class XII IPA, one of the public high schools in the Tanah Laut district. The readability questionnaire of teaching materials was used in the data collection method to evaluate readability. The data analysis method was used descriptively. The results showed that the teaching materials containing Al-Quran verses were practical regarding clarity of text and writing, appearance, ease of activities, clarity of instructions, attractiveness, and language use, so they met the practical category. The implication of this research is to help the development of physics teaching materials with Al-Quran verses that are more interesting for students, so that they can increase students' learning motivation by linking physics concepts with religious values.

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INTRODUCTION

One part of human resource development is education, which aims to improve individual intelligence and character. Education is every effort, influence, protection, and encouragement given to a child that aims to help a child become an adult and can carry out their life tasks (Adler, 2015; Asnawan & Sulaiman, 2020; Burns, 2020). The learning process must improve students' affective, psychomotor, and cognitive aspects (Abbasi et al., 2023; Astra & Henukh, 2021; Noor et al., 2020). In the 2013 curriculum, one of the affective domains of learners is spiritual attitude. One of the expected basic values is the spiritual perspective, which will produce learners who are virtuous and obedient to the teachings of their religion.

Based on faith and devotion to God Almighty, a person has a spiritual attitude, namely, behavior related to morals, that allows them to distinguish between right and wrong. The spiritual attitude aspect (KI-1) does not have subject matter, so the basic competencies related to spiritual attitudes are developed indirectly during cognitive domain learning (Bachtiar et al., 2018; Nachiappan et al., 2018; Oviana, 2015). Thus, teachers who implement the 2013 curriculum are expected to be able to instill the basic competencies of the affective domain, one of which is spiritual attitude. Education based on Quranic verses

can improve the spiritual aspects of learning. This has been proven in several previous studies, one of which was related to physics lessons.

The study of physics has many benefits for life. Physics lessons aim to equip students with knowledge and foster a sense of awe for God Almighty. The Quran explains the study of physics theory in advance, and Quranic verses can show the relationship between the Quran and physics (Chandra & Lizelwati, 2024; Mardayani, 2013; Mastuang et al., 2019). Therefore, when physics lessons are connected with verses of the Quran, students can realize and understand that the phenomena they learn and obtain in physics are evidence of the greatness of Allah SWT. Thus, the learning process becomes more meaningful.

Media is needed to facilitate its delivery to provide physics learning connected to the Quran verses. The most common learning media used to deliver the material is in the form of books. However, most books used as physics teaching materials do not relate physics learning to the Quran, so teaching books containing Quran verses are needed. The readability of teaching materials is an important factor in determining their feasibility. The readability of good teaching materials influences student learning outcomes in the form of increased knowledge after learning (Asysyfa, 2017 ; Hackemann et al., 2022; Rusnayati et al., 2019).

An interview with a physics teacher at one of the high schools in the Tanah Laut district showed no connection between physics learning and students' spiritual and religious aspects. In addition, the teaching materials used in physics lessons do not vary, and the learning resource books used in secondary schools do not serve as an intermediary between physics materials and Quranic verses. The books used as learning resources are only package books from one publisher, which contain physics material but are not associated with verses from the Quran, so students do not get more meaningful learning. Therefore, alternative teaching materials are needed to help teachers carry out learning activities related to Quranic verses so that learning becomes more meaningful because they can improve spiritual aspects and increase students' understanding.

Several studies have empirically shown that subject matter containing Quranic verses can improve students' learning outcomes. SMA Negeri 10 Banjarmasin's students better understood physics concepts and religious insights through a generative learning module on static fluid material that incorporates Quranic verses (Zainuddin et al., 2020). Teaching materials based on Quranic studies on static fluid are effective for improving student learning outcomes at MA Negeri 2 Parepare (Bahar, 2019). The development of CORE-based textbooks that combine Quranic verses with magnetic electricity material can improve learning outcomes and instill religious characters in the learning process (Fitriah et al., 2021). Similarly, learning physics based on Al-Quran improves students' spiritual attitudes more than learning physics without Al-Quran (Nisa & Farhan, 2016). Based on the description above, physics teaching materials containing Al-Quran verses have been widely developed. However, no research has been conducted that focuses on the readability aspect of teaching materials, so it is necessary to conduct a study that aims to determine the practicality of teaching materials as seen from the level of readability of the teaching materials for optical devices with Al-Quran verses developed. Therefore, this study analyzes the practicality of teaching materials that refer to Quranic verses on the material of optical devices.

METHODS

This research is a development research that uses a quantitative descriptive method. The ADDIE development model (Analysis, Design, Development, Implementation, and Evaluation) was used to develop teaching materials for optical devices with Quranic verses in XII IPA 1 and XII IPA 2 of senior high schools with a total of 42 students, consisting of

9 males and 33 females, in the odd semester of the 2023/2024 academic year. All learners involved in the study were Muslim, so they could freely give responses related to the teaching materials, using Quranic verses that were developed without any intervention from the researcher. The products produced in this study are teaching materials containing Quranic verses on optical devices. Teaching materials and assessment instruments were tested for validity first by one academic validator and two practitioner validators.

The practicality of teaching materials is measured by a questionnaire given to students at the end of the meeting when learning using the developed teaching materials is complete. The questionnaire is filled in with a check mark for each assessment aspect with a scale of 1-4. The teaching material readability questionnaire results show the practicality of teaching materials. The categorization method is used to calculate the readability assessment based on the significance of the difference. This category does not use a normal population distribution and categorizes people into low, medium, and high categories. It is used if the number of people in the group to be analyzed is not very large. Checking the significance of the difference between the mean empirical score (M), or sample mean, and the mean theoretical score (μ). The following equation shows the categorization interval equation.

$$\mu - t_{\left(\frac{\alpha}{2},n-1\right)}\left(\frac{s}{\sqrt{n}}\right) \leq X \leq \mu + t_{\left(\frac{\alpha}{2},n-1\right)}\left(\frac{s}{\sqrt{n}}\right) \quad (1)$$

with

$$\mu = \frac{1}{2}(i_{max} + i_{min})\Sigma k \quad (2)$$

Description:

μ	= Theoretical mean on the scale (hypothetical mean)
$t_{(\alpha/2,n-1)}$	= Price of t at α/2 and n-1 degrees of freedom
s	= Standard deviation of scores
n	= Number of items
i_{max}	= Maximum score of the item
i_{min}	= Minimum item score
Σk	= Number of subjects

(Anwar, 2010)

Table 1 shows the scores that indicate the readability level criteria. These criteria are obtained based on the calculation of scores given by students using the categorization equation based on the significance of differences. Calculate categorization based on the significance of differences using equations (1) and (2) to obtain the following criteria.

Table 1 Criteria for assessing the readability of teaching materials

Readability Score	Readability criteria
112 < X	High
98 ≤ X ≤ 112	Medium
X < 98	Low

(Adapted from Anwar, 2010)

RESULTS AND DISCUSSION

The product of this research is teaching material with Al-Quran verses, and the readability level of the teaching material measures its practicality. Teaching materials are a set of materials that are arranged systematically to create an environment where students can learn. In this study, teaching materials about optical devices were prepared based on the 2013 curriculum, which had been changed based on indicators. The teaching materials were divided into four meetings, as shown in the lesson plan, and referred to the predetermined syllabus. In addition, the teaching materials were equipped with verses from Al-Quran that are slightly related to the material of optical devices in each subchapter. The developed teaching materials consist of (1) cover; (2) foreword; (3) table of contents; (4)

introduction; (5) competency standards; (5) concept map; (6) Kalamullah (introduction); (7) material description; (8) competency achievement indicators and learning objectives; (9) open your Al-Quran; (10) sample questions; (11) student worksheets and questions; (12) follow-up exercises; (13) summary; and (14) bibliography. The display of teaching materials for optical devices with Al-Quran verses can be seen in Figure 1.

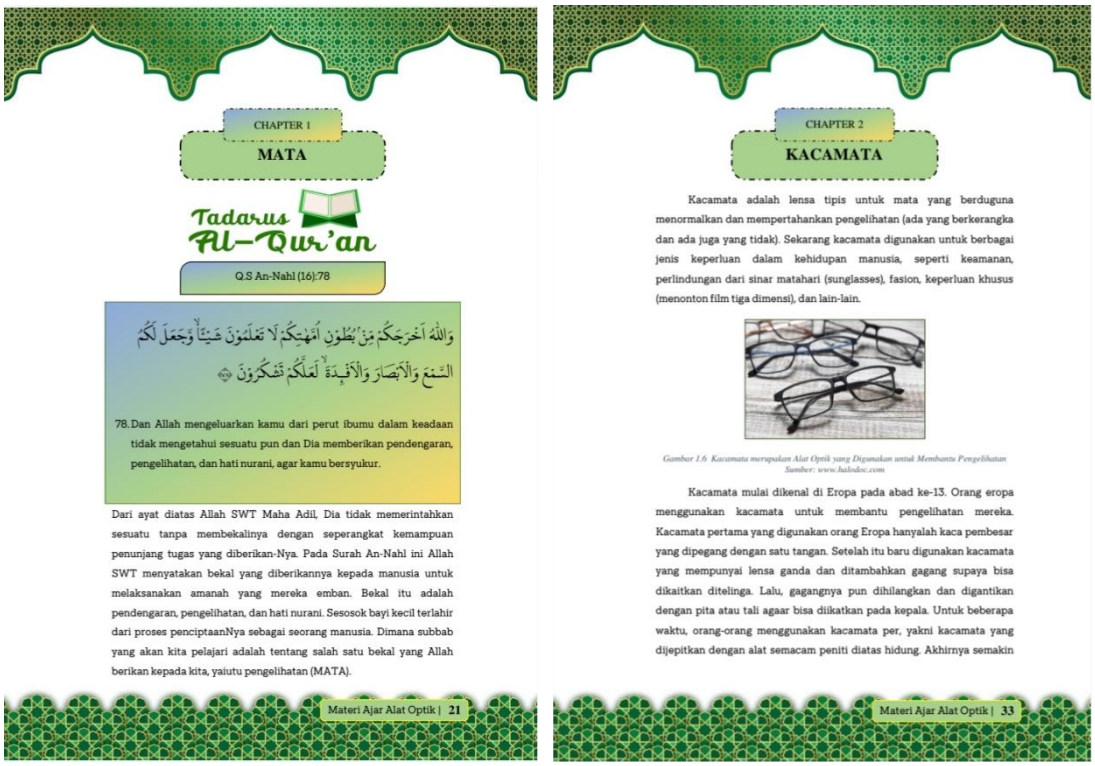

Figure 1 Display of teaching material contents

The results of the practicality of teaching materials containing Al-Quran verses can be seen from the readability scores obtained by students from the teaching material readability questionnaire. The use of questionnaires to assess readability is in accordance with the research of Fitriah (2019) and Rahayu et al. (2019). The readability questionnaire consists of six statements related to the use of teaching materials containing Al-Quran verses, and the readability assessment uses a Likert scale and is calculated based on the scores given by students for their responses to the readability questionnaire. The Likert scale in the questionnaire to determine the practicality of teaching materials is also applied in the research of Navisah et al. (2021) and Fitriah and Rahmawati (2022). The learners' response assessment results can be seen in the following table.

Table 2 The results of the learner response assessment.

Assessment Aspect	Score	Category
Clarity of text and writing	156	High
Display of teaching materials	141	High
Ease of activity	138	High
Clarity of directions and instructions	141	High
Attractiveness and motivation	146	High
Use of language	139	High

According to Table 2, students' responses to teaching materials containing Quranic verses were assessed in six aspects, and the teaching materials themselves received a high average readability score.
The results of an interview with one of the students of class XII IPA are shown in Figure 2.

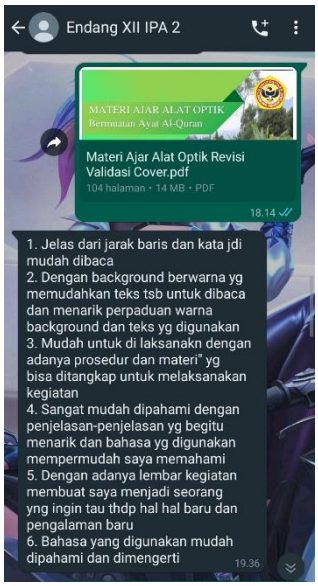

Figure 2 The results of an interview with one of the students of class XII IPA

The clarity of text and writing scored 156 for readability, indicating that this aspect has a high readability category. The teaching materials containing Quranic verses used in the learning process are arranged with clear text and writing and are easy to read by students. As a result of interviews conducted with students of class XII IPA, they said that the teaching materials were easy to read because the line spacing and words were clear. In addition, some students stated that the writing and text presented were very clear and easy to understand. This result can be achieved because this teaching material is arranged with a medium text size so students can see it clearly and easily. In addition, the text and writing in the teaching materials are written using a dark black font and a white and light green background, so there is a difference between the text and the background. This makes it easier for readers to understand and read the text. This is supported by Divan (2018), who states that the purpose of using white as the background color and black text on the subject matter is to make the material clearer and easier to read, so the message contained in the text can be conveyed well to the reader. According to Siregar (2020) if the use of letters in printed teaching materials is not too small and easy to read, and the background color contrasts with the letters so that the writing is easy to read, then the teaching materials are suitable for the learning process.

The display of teaching materials received a readability score of 141, which indicates that this aspect has a high readability category. As a result of interviews conducted with students of class XII IPA, they said that the color combination between the text and the background is interesting, making the text easier to read. In addition, some students said that the colors in the subject matter were just right, not too bright or monotonous, thus reducing boredom. This result can be achieved because the lesson materials containing Quranic verses are equipped with illustrations and pictures related to the topic discussed. In addition, the appearance of the material becomes more interesting and helps students understand what they are learning. Nikat (2021) states that images, graphs, verbal, and

mathematics are forms of representation often used in physics learning. Physical science becomes more interesting and easy to understand if presented with various modes of representation, such as mathematical models, symbols, graphs, illustrations, tables, diagrams, and images. In addition, according to Nida (2021), because the teaching materials do not only consist of writing but also have pictures, students feel interested in reading them. The use of images and colors in teaching materials makes them interesting to use. This is supported by Yusuf (2019) who argues that subject matter equipped with images relevant to the text presented makes the lesson more interesting, increases motivation, and makes the text easier for students to understand. Reinforced by the opinion of Hanifah (2020) who said that teaching materials designed with concise and systematic explanations and accompanied by images help students understand what is conveyed in the learning process.

The ease of activity aspect scored 138, indicating that this aspect has a high readability category. This result can be achieved because this teaching material has a table of contents, helping learners find the subchapters of material they need. In addition, this teaching material contains learner worksheets to help them conduct experiments during learning. These worksheets are equipped with experiment objectives, directions, and steps, making it easier for learners to follow the lesson. As a result of interviews conducted with students of class XII IPA, they said that the teaching materials made the activities easy to do because there were instructions to do so. In addition, some students said that with the explanation given, these activities could be carried out by students. According to Dismarianti (2020), one of the characteristics of good teaching materials is *self-instruction*. *Self instruction* in teaching materials must include instructions that make students easy to use teaching materials and know the learning objectives. This result is supported by Astuti (2021) who states that users will find it easier to use learning devices if instructions for using worksheets, learning instructions, and instructions for carrying out activities are given clearly for each meeting.

The clarity of the directions and instructions received a readability score of 141, which indicates that this section has a high readability category. This result can be obtained because an instruction page explains the content in the teaching materials and makes it easier for learners to use them. As a result of interviews conducted with students of class XII IPA, they said that the instructions for using the book were very easy to understand, with interesting explanations, and the language used was very easy to understand. Other students also said that the book's instructions were clear and easy to understand. According to Wati et al. (2020), to ensure that the subject matter can be implemented quickly and efficiently, teaching materials must be described in detail so that teachers and students can use them easily. This is in accordance with Dayanti (2021), who states that instructions for using teaching materials are needed so students can use them more easily. This opinion is supported by Khairunnisa (2018) who states that to make teaching materials easier for students to understand, they must be arranged systematically and pay attention to the presentation structure. The structure of teaching materials includes instructions for using teaching materials, competencies to be achieved, content or content of learning materials, supporting information, exercises, work instructions, evaluations, and responses.

The readability results for the attractiveness and motivation aspects received a score of 146, which indicates that this aspect has a high level of readability. This result was obtained by applying images with Islamic nuances to the header and footer of each page of teaching materials. In addition, applying green as the dominant base color makes the teaching material look more attractive and not monotonous. As a result of interviews conducted with XII IPA class students, they said that the activity sheets in the teaching materials were interesting and made them curious about new knowledge and experiences. In addition, they

said that the activity sheets in the teaching materials were very interesting and could motivate them, especially because there were objects presented in each activity sheet. According to Juliana (2023), teaching materials should contain content that is appropriate to the learning objectives and contain images, illustrations, and text. Teaching materials should contain more than just text to be useful because they can help students learn and motivate them to learn physics. This is supported by Pralisaputri (2016) who states that interesting teaching materials can foster students' curiosity so that they easily understand what is conveyed during learning. The teaching materials developed are considered interesting and easy to understand, to provoke students' curiosity to continue learning and do the activities in the teaching material worksheets. This is supported by Sarip (2022), who states that learning media that is easy to understand, has interesting content, has an attractive design, and uses simple sentences tends to encourage students to learn concepts that are considered difficult independently. So that when learners can repeat the same material repeatedly, their interest in learning will automatically increase.

The readability results of the language use section received a score of 136, indicating that this section has a high readability category. In the learning process, teaching materials must be organized with good language to convey the material's content well. According to the XII IPA class students interviewed, the language used in the teaching materials is clear and easy to understand. According to Purnamasari (2020), correctly compiling teaching materials using Indonesian is highly recommended. The use of good and correct Indonesian in the subject matter indirectly affects students' ability to make Indonesian sentences during learning activities. Using correct and good Indonesian when creating lesson materials for learners is important. Good and correct language will make it easier for learners to understand the material being taught. This is reinforced by Paramita (2018), who states that teaching materials must be prepared using good and correct language by paying attention to preparing clear sentences so that teaching materials can be conveyed well and easily understood.

CONCLUSION

The teaching materials incorporating Quranic verses into the teaching materials of optical devices developed, including practical ones, have a high level of readability and show that these teaching materials are suitable for use in learning activities. The implication of this research is to help the development of physics teaching materials with Al-Quran verses that are more interesting for students, so that they can increase students' learning motivation by linking physics concepts with religious values.

CONFLICTS OF INTEREST

The author declares that there is no significant conflict of interest in the research and writing of this article.

AUTHOR CONTRIBUTIONS STATEMENT

ED: conceptualized, analyzed, and wrote the paper; SH and Z: conducted data analysis and validation.

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