Integrating Islamic Values into a Science Comic Book as an Instructional Media for Junior High School Students

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Abstract

This study examined the validity of a science comic book integrated with Islamic values. The development of the book followed the steps of ADDIE (Analyze, Design, Develop, Implement, and Evaluate). The product was validated by an expert in Islamic studies, an expert in instructional media, an expert in instructional material, and a science teacher. A questionnaire was used to obtain data validation results. The expert validation results showed a score of 3.8 for the integrated Islamic values, 3.5 for the material, 3.5 for the book function as instructional media, and 3.7 for the product practicality, with all scores falling into the "very valid" category. At the implementation stage, the book was tried on a student individual, a small group of students, and a larger group of students to conduct practicality of the product from students' responses. The students' responses showed scores of 86.25% (individual trials), 84.44% (small-group trials), and 85.94% (large-group trials), with all scores falling into the very good category. These results indicate that the science comic book integrated with Islamic values can be implemented in the science classroom. At the evaluation stage, formative evaluation was conducted. It collects expert suggestions to revise a comic.

Keywords: Development, Science Comic Book, Islamic Values

INTRODUCTION

Learning success can be achieved by establishing effective communication between the learning components. One way of shaping this communication is using learning media. Instructional media is a tool used to facilitate communication during the learning process. Tamam et al. (2022) state that instructional media includes all objects used to present information (content knowledge) to students, thus promoting learning activities and problem-solving in the classroom (Adegbija and Fakomogbon, 2012).

Syawaluddin et al. (2020) found that instructional media appealed to students cognitively and emotionally. The use of instructional media in the classroom increases students' interest in learning, their motivation, and their satisfaction with the learning process. Instructional media helps to convey information, ideas, and skills and to explain the importance of information so that learning objectives are achieved effectively and efficiently (Adegbija & Fakomogbon, 2012). Instructional media also facilitates the limitations of space, time, and senses, as it can display abstract objects, even from a distance (Tamam et al., 2022). Therefore, science instructional media must continue to evolve accordingly and adopt new perspectives in order to increase the efficiency of science learning and make it as durable as possible (Aşci, 2020).

In fact, science learning is still dominated by conventional learning (Hasan et al., 2013), which relies heavily on textbooks. Science textbooks place too much emphasis on factual information, thus lacking in attractiveness (Jessani, 2015) and relevance (Jessani, 2015; Sadera et al., 2020). Therefore, textbook-based learning is often boring for students (Syawaluddin et al., 2020; Sadera et al., 2020). Science contains abstract concepts. Science textbooks are written in a scientific language which is sometimes difficult for students to understand (Osborne & Collins, 2001; Akcanca, 2020). Scientific language in science textbooks can reduce students' interest in science lessons and lower the efficiency of science learning (Akcanca, 2020). During a textbook-based learning process, students pay little attention to learning, are not actively involved, or appear unenthusiastic about science learning activities (Sadera et al., 2020).

One of the solutions is to develop instructional media that can meet students' current needs. Science instructional materials or media development must adopt a new learning perspective (Akcanca, 2020), such as using comic books to teach science. Nowadays, comic books are very popular

as learning resources (Aiken, 2010; Kuttner et al., 2020) and also in science classes (Jee & Anggoro, 2012). The use of comic books as an educational tool has increased substantially, as comic books can be both entertaining and affordable (Goldenberg, 2016). According to Ntobuo et al. (2018), comic books can meet current learning needs. In addition, comic books can serve as visual communication media to properly convey instructional messages, where the learning context relates to the communication process between students (Ntobuo et al., 2018). In short, comic books are useful for communicating scientific information to students (Kearns & Kearns, 2020).

Comic books are a form of narrative that sequentially combine visual imagery and text (Almeida, 2017; Scavone et al., 2019; Hamza Taha & Hassan El-Sayed, 2021; Lin et al., 2015) that rely on one another to provide information (usually narrative, but also descriptive or aesthetic) (Almeida, 2017) efficiently (Ronan & Czerwiec, 2020). Comic books convey realistic or imaginary ideas through visual images. Comic books can deliver important messages in the form of humor (Toh et al., 2016). According to Lee et al. (2019), comic books can express affective and aesthetic feelings as well as influence readers' affective processes and reactions. Comic books allow students to actively participate in analyzing material by giving meaning to pictures and text (Versaci, 2008)

Comic books that aim to transfer information and communicate concepts are called educational comic books (Hamza Taha & Hassan El-Sayed, 2021). The comic books developed in this study are a sub-genre of scientific comic books. Tatalovic (2009) states that comic books are very potential and effective for learning science. Tatalovic (2009) also explains that science comic books primarily aim to communicate science or enlighten readers about non-fictional and scientific concepts or themes and use humorous pictorial narration to convey scientific information (Lin et al., 2015). According to Jee & Anggoro (2012), the narrative structure of a comic book delineates everyday life so that it makes science easy to understand. The combination of images and text in comic books helps students see the scientific process as more interesting and changes students' perspectives on the learning process (Astuti et al., 2014). Comic illustrations can explain concepts much more clearly and interestingly (Hands et al., 2018). Similarly, Koutníková (2017) reports that comic books may be very useful for making science concepts fascinating and understandable for

children, as they present everyday life experiences that hide scientific content.

Learning should be based on students' activities, interests, learning experiences, communication, and cooperation. Comic books can be used in the classroom to realize these goals (Koutníková, 2017). Comic books provide visual-based learning. According to Chai (2019), visual-based learning engages students in critically acquiring knowledge, and it positively increases motivation to read (Cimermanová, 2015). Akcanca (2020) explains that comic books can be used as a powerful additional teaching tool to concretize abstract science concepts and present them in an entertaining way. Comic books are very useful for teaching science in a short, precise, and effective way and can help explain a world consisting of abstract science concepts to students (Morel et al., 2019). Koutníková (2017) claims that comic books are the best tool to stimulate students to think creatively.

Various studies reveal that the use of comic books in the classroom is successful in communicating science (Kearns & Kearns, 2020) and makes a positive contribution to the teaching-learning process (Mamolo, 2019). Comic books can increase students' reading interest and enthusiasm because they contain many interesting illustrations compared to textbooks (Ramadhani et al., 2021). Comic books can strengthen students' conceptual understanding (Affeldt et al., 2018; Saputra & Azka, 2020; Mioramalala et al., 2021) and build positive attitudes (Mioramalala et al., 2021). Lubis (2018) asserts that e-comic books can increase students' reading curiosity. Students are interested in comic books because they have a simple form, are easy to understand, and contain funny and everyday-context material (Chung & Chung, 2018). Comic books also create a more intense learning experience (Affeldt et al., 2018). Comics are proven to be able to convey scientific information accurately, be lighter, and more enjoyable to look at and read than information conveyed in the form of text or in graphics (Pinheiro et al., 2020).

In the production of educational comic media, it is important to consider the emphasis on moral values when formulating learning objectives. Sadera et al. (2020) and Subakir (2020) found that the problems facing the millennial generation are becoming increasingly complex today, ranging from issues of moral decay to increasingly liberal and even radical views and social media abuse (Subakir, 2020). Therefore, education must aim to mold people into virtuous or noble personalities, individually and socially (Subakir, 2020). Therefore, education must aim to

mold people into virtuous or noble individuals or social human beings (Lickona, 2012). Learning, including science learning, must emphasize the strengthening of students' attitudes, behavior, or moral actions (Lickona, 2009).

Suparjo et al. (2021) claim that an integrative approach between science and religion is highly beneficial for students' cognitive and character development. Kasim & Yusoff (2014) assert that science should contain religious knowledge. Scientific material should be related to religious values, even if it is objectively different. General Science and religious knowledge have a strong relationship and are not contradictory to each other. Islamic teachings include parts of the Qur'an and Hadith relevant to science; therefore, they can be integrated into science education.

Although many studies have proven that comic books have a positive impact on learning, the use of comic books in the science learning process is still limited and not optimal. Therefore, there is a need to develop science comic books integrated with Islamic values for junior high school students. Through the development of these comic books, it is hoped that there will be a new perspective in presenting science learning that is integrated with Islamic values, where science learning should not only present knowledge but also incorporate spiritual aspects. This study aims to identify the validity and practicality of comic books integrated with Islamic values.

METHOD

Development Models

The development of science comic books integrated with Islamic values followed the steps of ADDIE (Branch, 2009), which are depicted in Figure 1. This model of study was chosen because of it was simplicity to be learned and systematic structure (Pribadi, 2009); it was dynamic and flexible in developing effective learning that ensure compatibility between goals, strategies, and evaluation (Basu, 2014).

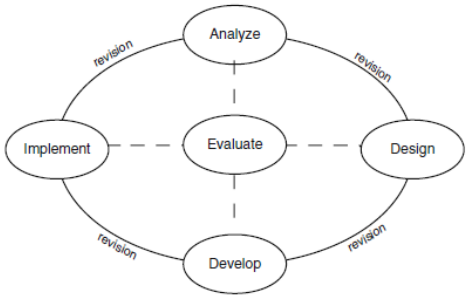

Figure 1. The ADDIE Model Development

Analyze

The "analyze" stage is the initial stage in ADDIE, which was done to identify the gap in students' academic performance (Branch, 2009). At this stage, we analyzed the learning activities currently being carried out in the

classroom, the instructional materials and media used by the teacher, and the learning objectives using observation checklists and interview guidelines. At this stage, we also determined the topics to be taught in the classroom, the learning objectives to be achieved, the learning content to be delivered, and the suitability of the material for the target audience (Sahaat et al., 2020). Science subject was chosen, especially food as energy resources, because this topic is relevant to the halal topic and close to everyday life.

Design

At the “design” stage, we determined the type of instructional media to be developed and determined the prototype design. Furthermore, the development of a validation instrument was also carried out to assess the validity and practicality research product. This stage generated learning objectives and the instructional media prototype.

Develop

The "develop" phase is the production and validates product development (Branch, 2009). This stage produced the designed product, namely a science comic book that is integrated with Islamic values. Product validation was carried out at this stage (Branch, 2009), which entailed media, material, and Islamic values validation by media experts, material experts, Islamic experts, and a teacher. The media expert chosen in this study was a minimal qualification of a master's degree in science education with media expertise; the material expert chosen has a minimum qualification in science master degree; the Islamic expert chosen was a doctoral degree in Islamic education; while the teacher in this study was considered as experts, because of their five years experiences in teaching science. In addition to experts and teachers, students were also engaged to provide feedback on the media by filling out a questionnaire with a Likert scale of 0-4 scale. At this stage, experts provided suggestions and input for product improvement. Furthermore, revisions were made based on the suggestions of these experts. After the comic book was validated, the product trials were carried out individually, in small groups, and in large groups. The trials were carried out in the next stage, the "Implement" stage.

Implement

At the "Implementation" stage, a group of students was involved (Branch, 2009) to find out a student's response to comic books. The trials were done to find out the practicality of the product. This stage involved three students for one-to-one trials, nine students for small group trials, and 32 students for large group trials. All trial participants were eighth graders at one of the Islamic State Junior High Schools in Pamekasan, Madura,

East Java, Indonesia. Field trials were conducted to obtain student responses to the use of the comic book in the classroom.

Evaluate

The "evaluate" stage was carried out to assess the quality of the product (Branch, 2009). The product evaluation was in the form of a formative evaluation. A formative evaluation was carried out during development and implementation. The instruments used in this study were an expert validation questionnaire consisting of media experts, material experts, and Islamic experts and a student response questionnaire.

Data Analysis

Data analysis was performed in a quantitative and qualitative descriptive. Scores given by the experts were calculated on each aspect evaluated. The average score for each aspect was interpreted based on the criteria presented in Table 1. The student's responses to the 0-4 scale questionnaire were then interpreted based on the categories in Table 2.

Table 1. Criteria for Expert Validation Score

Score	Criteria
3.26 – 4.00	very valid
2.51 – 3.25	valid
1.76 – 2.50	less valid
1.00 – 1.75	very invalid

Table 2. Criteria for Student Response Score

Percentage	Category
0-20%	Very poor
21-40%	Poor
41-60%	Fair
61-80%	Good
81-100%	Very good

RESULTS AND DISCUSSION

The Research and Development (R&D) design was applied to develop instructional media to facilitate learning (Ibrahim, 2016). The current study aimed to improve (Tessmer, 1998) and enhance the quality of the learning process (Reigeluth and Frick, 1999). In this study, we followed the steps of ADDIE (Analyze, Design, Develop, Implement, and Evaluate) (Branch, 2009) to develop a science comic book integrated with Islamic values. At the "analyze" stage, we distributed a questionnaire to science teachers through the Science Teacher Forum. Based on the results of the observation and interviews with the teachers, we found that science education in their schools adopted the Curriculum 2013. The curriculum 2013 is a curriculum that was implemented in Indonesia in 2013 and was perfected in 2016 and 2017. This curriculum is a refinement of the competency-based curriculum and focuses more on attitude, knowledge, and skills competencies in an integrated manner (Nursamsu & Baihaqi, 2016). Furthermore, it is also revealed that the learning process was largely

dominated by conventional learning methods. It was also found that science teachers rarely used instructional media to support the learning process, as learning relied heavily on textbooks. Besides, the instructional media and material were not integrated with Islamic values. Given this condition, the teachers strongly favored the idea of developing a comic book as instructional media to support science learning in their schools.

Determination of the material to be included in the comic book was also carried out at this stage. The comic book covers materials related to food as a source of energy. Furthermore, we analyzed the verses of the Qur'an that are suitable for integration into the comic book. The results of the analysis of core competence, basic competence, and learning indicators can be seen in Table 3, while the Qur'an verses and hadith that are relevant to science education are shown in Table 4.

Table 3. Analysis of Core competence, Basic competence, and Learning indicators

Core competence	Basic competence	Learning Indicators
Understanding knowledge (factual, conceptual, and procedural) based on curiosity about science, technology, art, and culture related to visible phenomena and events.	Analyzing the concept of energy, various sources of energy, and changes of energy in everyday life, including photosynthesis	• Identifying the types of nutrients needed by the human body • Identifying the types of food, whether good or not, for the body • Identifying the nutritional content of food as a source of energy • Explaining the function of the types of nutrients for the human body as a source of energy • Classifying types of food based on their nutritional content • Analyzing the contents of food, whether consumable or not, according to science and the Islamic religion • Concluding the types of food, whether consumable or not, according to science and the Islamic religion

Table 4. Verses of the Qur'an and Hadith Integrated into the Science Comic Book

No	Qur'an Surah and Verses, and Hadith
1	Surah Al-A'raf verse 31 says, "*O children of Adam! Dress properly whenever you are at worship. Eat and drink, but do not waste. Surely, He does not like the wasteful".*
2	Surah Al-Baqarah verse 168 says, "*O humanity! Eat from what is lawful and good on the earth and do not follow Satan's footsteps. He is truly your sworn enemy".*
3	Surah An Nahl verse 114 says, "*So eat from the good, lawful things which Allah has provided for you, and be grateful for Allah's favors if you truly worship Him alone."*
4	Hadith Ibn Abbas RA No. 3574, 3573, 3572, 3571, and 3570 which says, "*Allah's Messenger (may peace be upon him) prohibited the eating of all fanged beasts of prey, and all the birds having talons."*
5	Surah Al Maidah verse 3 says, "*Prohibited to you are dead animals, blood, the flesh of swine, and that which has been dedicated to other than Allah, and (those animals) killed by strangling or by a violent blow or by a head-long fall or by the goring of horns, and those from which a wild animal has eaten, except what you (are able to) slaughter (before its death)."*
6	Surah Al An'am verse 145 says, "*Tell them (O Muhammad!), "I do not find in what has been revealed to me anything forbidden for anyone who wants to eat unless it is carrion, outpoured blood and the flesh of swine, all of which is unclean; or that which is profane having been slaughtered in a name other than that of Allah."*
7	Surah Al-An'am verse 121 says, "*Do not eat of (the animal) over which the name of Allah has not been pronounced (at the time of its slaughtering), for that is a transgression."*

Based on the learning indicators derived from Core competence and Basic competence (shown in Table 3), Islamic values (shown in Table 4) needed to be integrated into this comic book development. Integrating Islamic values into the learning media, especially in students' everyday life phenomena, provides a more meaningful learning experience (Purwati et al., 2018). Islamic values were integrated into learning indicators. This is because learning indicators are the guidance to measure the comprehensive learning achievement between knowledge, intellectual competence, and spirituality. This learning experience could boost students' motivation which increases students' understanding of some topics of materials (Bahri & Corebima, 2015). The analysis stage was then followed by the design stage, which produced the blueprint for the comic book prototype (Figure 2).

(a) Cover

(b) Science concept related to nutrients contained in meat and their benefits

(c) The integration of Surah An-Nahl verse 114 into the comic book content

(d) The integration of hadith into the comic book content

Figure 2. The Prototype a Comic Book with Islamic values

The Develop stage is an advanced stage of the design stage. This stage realized the prototype developed at the design stage. The realization of the comic book design was carried out using the Coreldraw-2019 application. The results

of the development of the comic book can be seen in Figure 3.

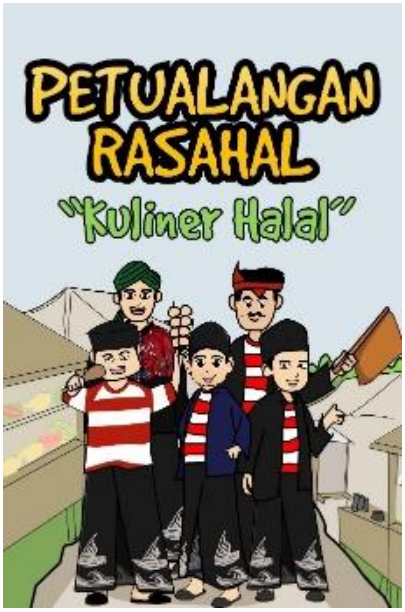

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Figure 3. The Comic Book with Islamic Values

Expert validation was performed at the development stage. The expert validation results determined whether the product was ready for implementation.

Table 5. shows the results of the expert validation.

Table 5. Expert Validation of the Comic Book Integrated with Islamic Values

No	Indicator	Score	Category
1	Integration of Islamic values	3.8	very valid
2	Materials	3.5	very valid
3	Media	3.5	very valid
4	Practicality	3.7	very valid

Table 5. indicates that the comic book integrated with Islamic values was valid and ready for implementation. According to Richey & Klein (2005), development research does not only focus on producing products but also on evaluation which is sometimes carried out with a validation process. Valid criteria indicate that product development can be trusted and is able to help achieve learning objectives (Mohajan, 2017). The validity referred to here is content validity (relevant), namely being able to measure what is to be measured or in accordance with state-of-the-art knowledge (Nieveen, 1999).

Experts considered that the comic book developed in this study met the valid criteria as an instructional medium. These findings indicate that the verses of the Qur'an and hadith integrated into the comic book can provide an understanding of Islamic values related to science. The integration of Islamic values in science learning is a mandate stated in Government Regulation no. 19 of 2005 Article 6 Paragraph (1), which reads, *"At the educational level of Madrasah Aliyah or its equivalent, studies of religion and noble character can be integrated into subjects of religion, science, and technology*." Religious values and socio-religious attitudes should receive special attention from teachers as these can influence classroom learning and ultimately affect students' ways of thinking and learning (Hamdan Alghamdi and Saud Al-Salouli, 2013).

The principles and values of Islamic teachings are oriented towards socio-religious attitudes so that they can assist and direct teachers in making pedagogical decisions in teaching science issues related to religion (Mansour, 2011). Similarly, research by (Purwati et al., 2018) indicated that science learning integrated with Islamic values had a significant influence on the actions and daily behavior of the seventh graders at Madrasah Tsanawiyah in West Lombok, Indonesia. In addition, Susilowati (2017) discovered that learning using science textbooks integrated with Islamic values could

improve students' understanding of science and religious attitudes.

The materials covered by the science comic book integrated with Islamic values currently developed were declared very valid by the experts. Textbook material is declared valid if the components of the book are based on knowledge principles (Yeni et al., 2019). Abidin (2014) states that the materials covered by the comic book integrated with Islamic values were in line with the principles of relevance, consistency, and adequacy. Based on the principle of relevance (relatedness), the material developed should be related to core competencies, basic competencies, and learning objectives. Meanwhile, consistency refers to a principle related to the amount of material covered in a book that needs to be adjusted to the competencies to be achieved. Adequacy relates to the depth and breadth of learning materials provided to assist students in achieving competency (Abidin, 2014).

Furthermore, the expert validation on media aspects (visualization, typography, comic characters, and material presentation) showed that the comic book developed in this study was very valid. This result indicated that the comic book was ready for use in the classroom. Comic books as learning media have many advantages; one of them is that they are very easy to use due to their simple form of presentation (Udayani et al., 2021). According to Ntobuo et al. (2018), pictures in comic books can develop students' creative ideas. The pictures presented in comic books are also interesting and entertaining. Visualization of comic books can stimulate students' interest in reading them and keep reading the contents (Buchory et al., 2017). Typography is the art of composing, selecting, and assembling the layout of letters and typefaces to help create compatibility between the concept and the composition of the work (Maharsi, 2013). Typography helps communicate information effectively through the selection of characters and letter features in comic books. The selection of characters in the comic book developed in this study was also considered in accordance with the characteristics of junior high school students in Madura, particularly those with strong religious roots.

The results of the teacher validation questionnaire also confirmed the validity of the comic book. Supriyanto et al. (2017) claim that the quality of a product is not only determined by its validity aspect but also determined by its practicality level.

Practicality, in this case, is the extent to which the product can be implemented and utilized by its users. This study's findings indicate that the science comic book integrated with Islamic values was highly practical; thus, it can be used in teaching science.

The development stage was followed by the implement and evaluate stages, where we implemented the comic book in the classroom and collected feedback on the implementation of the comic book. Student responses can be seen in Table 6.

Table 6. Student Responses to the Science Comic Book Integrated with Islamic Values

Subject	Percentage	Category
Individual	86.25%	very good
Small group	84.44%	very good
Large group	85.94%	very good

The students in the individual, small group, and large group tests responded positively to the comic book. This finding suggests that the product developed can be accepted and implemented by junior high school students as users. The results of the questionnaire analysis also indicated that the comic book could be used in science learning. These findings are in line with the research by Rahayu & Kuswanto (2020) and Roswati et al. (2019), who found that comic books could be well implemented in science subjects.

The implementation of the comic book integrated with Islamic values in science classes could also stimulate students' interest in learning and help students develop their competence. This is consistent with the findings Kim et al. (2016), who suggest an increase in student interest in learning anatomy after reading comic books. Furthermore, comic books allow students to learn independently. Learning materials presented in the form of comic books can enhance students' understanding of the subject. Comic books present learning materials in an interesting way and are based on everyday life, keeping students interested and helping students understand the materials (Chung & Chung, 2018).

CONCLUSION

The results of the current study showed that the comic book integrated with Islamic values was valid and practical. Thus it can be used in the classroom as instructional media. This finding implies that the science comic book can be implemented and disseminated in science classrooms. Teachers should implement this comic book as an alternative source of learning to support a more effective learning process that can attract students' interest

in learning science. In addition, integrated learning is also important to be applied in the classroom to prepare students to deal with the complexity of everyday problems.

We acknowledge some limitations of this study. First, the comic book only covers materials related to food as a source of energy. Besides, the development of comic books is only intended for junior high school students. Therefore, future researchers will need to consider other topics to include in the comic book and, if possible, develop an entirely new comic book to teach subjects other than science. Future studies must also examine student achievement in a particular competency through the implementation of the comic book integrated with Islamic values.

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