

Integration of Islamic Values in Electronic Comic Media on Vibration, Waves, and Sound

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Abstract. This comic electronic media is a comic that is uploaded on a webtoon. Students more easily access it via smartphones. This study aims to determine the feasibility of electronic comic media based on problem based learning integrated with Islamic values based on the assessments of material experts, media experts, and learning experts. This study uses a Research and Development (R&D) approach with the ADDIE model (Analysis, Design, Development, Implementation, and Evaluation). The data collection technique used is a research instrument with quantitative data analysis. The feasibility of material experts on each indicator obtained an average of 84.28% with very feasible criteria. Assessment from media experts received an average of 82.77% on each indicator with very decent standards. The feasibility of the media based on the evaluation of learning experts on each indicator obtained an average of 100.00% with very feasible standards. The test of electronic media based on Islamic-based learning problems shows the criteria are very feasible to be tested. This media can then be used as a science learning medium for vibration, waves, and sound materials in everyday life for grade VIII junior high school.

Key words: electronic comics; problem based learning; islamic values.

How to Cite: Praptiwi, U.S., Yulianto, A., Ellianawati, E. (2021). Integration of Islamic Values in Electronic Comic Media on Vibration, Waves, and Sound. *ISET: International Conference on Science, Education and Technology*, 7(1), 625-631.

INTRODUCTION

At a time, Indonesians were facing the Covid-19 virus outbreak. The government urges all Indonesians to comply with health protocols to prevent the spread of the Covid-19 virus. This impacts learning activities in schools that cannot carry out as usual to provide a sense of security for students and teachers (Handayani & Jumadi, 2021). Students must study from home, while teachers work from home and integrate student learning activities. Learning from home is done online by utilizing current technological advances that make it easier for everyone to access the internet. Teachers must be more innovative when arranging learning steps for implementing online learning (Sari, 2021). Teachers also need to choose the suitable media to use in learning to attract students to learn. Learning media that is appropriate to the stage of child development is comic media (Rina et al., 2020).

Comics are visual media used as media in learning activities (Styaningsih et al., 2016). Comics are used as a tool to convey information to readers. Comics are currently multiplying in the form of comic books and the structure of electronic comics. Electronic comics are presented on websites, webcomics, online, or online (Raneza & Widowati, 2020). Electronic comics can be installed via smartphones, making them more accessible to readers. Comics are presented with colorful illustrations and

storylines, concise, easy-to-understand, realistic comic characters that can attract students' attention.

The results of Shekarbaghani's research (2016) show that students are more interested in reading material presented in comic form than by reading textbooks. Comics can also increase students' interest and motivation to learn and make it easier to understand learning materials (Affeldt et al., 2018; Roswati et al., 2019; Tribull, 2017). Learning to use comics can also trigger students to solve problems by providing scenarios related to everyday life (Jamal et al., 2019). Presentation of issues in everyday life in learning is closely associated with the problem-based learning model. The application of the problem-based learning model in education is an effort so that students can solve problems with higher-order thinking (Fauzan et al., 2017).

Problems in everyday life can be presented in comics, especially on vibration, waves, and sounds in everyday life. The material has a lot to do with the problems that exist in the daily life of students. Examples of issues that can present are laryngeal allergies that cause vocal cord pain, ringing in the ears due to errors in cleaning the ears, sound reflection applications, noise experienced by workers in rice mills. These bomb explosions cause resonance and other problems. The problem is told in an electronic comic based on problem-based learning, making students

understand that it is closely related to vibration, wave, and sound learning materials in everyday life.

Integrated learning combines a theme in one field of science and between areas so that students can gain holistic and meaningful knowledge (Susilowati, 2017). Teaching materials integrated with Islamic values can significantly affect student learning outcomes, are effective for learning and are easier to master (Ananda, 2018). Learning that integrates Islamic values in science learning is still not widely applied. Electronic comics integrated with Islamic values in the form of verses of the Qur'an on the material of vibrations, waves, and sounds in everyday life have not been investigated. An example of the integration of Islamic values is in the waves, which are one of the waveforms in the Qur'an Surah Hud verse 43. This human heart corresponds to the Surah Al-Anfal verse 2 that in waves, resonance can occur if there is a similarity in frequency and sound reflection is linked to the verse of the Qur'an Surah An Naml verse 16. The novelty in this research is to see the feasibility test of developing electronic comic media on webtoons associated with everyday problems and integrated with Islamic values.

Based on this background, who conducted this research to test the feasibility of electronic comic media based on problem-based learning that integrates Islamic values in science subjects with vibration, waves, and sounds in everyday life for class VIII Junior High School. The feasibility test for appropriate learning media used in the science learning process is based on the assessment of material experts (aspects of the truth of the material or concepts, depth of concepts, breadth of concepts, implementation, and language), media experts (linguistic aspects, comic anatomy, overall appearance) and learning experts (material aspects, learning applications, language aspects).

LITERATURE REVIEW

Comics are cartoons created to entertain readers. According to (Panjaitan et al., 2017), learning media that have been interesting for students are comics. Comics have an excellent opportunity to attract students' interest in learning. Comics are divided into educational comics and commercial comics. This research will focus on educational comics. The health department and industry widely publish informative, educational comics. Examples from comics in the health sector can help reduce stress,

fear, and anxiety in children while waiting for surgery (Vasques et al., 2020).

Comics today are not only in the form of books but have developed into electronic comics. Electronic comics are illustrated stories with definite characters presented in electronic media (Yuliana et al., 2017). The cover page of the comic consists of the title of the story or the title of the series, credits, and indica. The elements of the comic content page consist of panels, aisles, narration, word balloons, and sound effects. The word balloon is essential because students pay attention to the learning information contained in the word balloon (Reid & Moses, 2020). The material presented in a storyline is easy for students to understand related to student life.

Vibration, wave, and sound learning materials are closely related to student life. This material can explain the vibrations in pendulums and springs, vocal cord polyps, waves in water ripples, transverse and longitudinal waveforms, sound, sound propagation medium, the mechanism of human hearing, resonance on a tuning fork, sound reflection, and its applications. The material is presented with a storyline that triggers students to solve problems to be directly involved in learning activities. This is closely related to the Problem Based Learning (PBL) learning model or problem-based learning model presenting the issues in the surrounding life.

Learning with problem-based learning models has been formed based on innovative learning theories that trigger to find the right solution to a problem (Mayasari et al., 2016). Learning using a problem-based learning model begins with choosing the type of problem for students, including open and structured issues. In structured topics, to answer the problem, students are faced with sub-problems and conclusions. In available cases, students are faced with issues that have many alternatives to solve and have one or more correct answers (Nurdyansyah & Arifin, 2018).

Islamic values can increase belief in Allah and raise awareness that everything that happens already exists who creates and regulates it (Ramadanti, 2020). Integrating Islamic values in science learning is essential in shaping students' character by developing learning media, learning models, and teaching materials (Mulyani et al., 2018). The integration of values can also be done by connecting the verses of the Qur'an with the concepts being studied (Nuryantini, 2018).

METHOD

Research Goal

This study aims to determine the feasibility of electronic comic media based on problem-based learning integrated with Islamic values based on the assessments of material experts, media experts, and learning experts.

Sample and Data Collection

Data collection techniques using research instruments with quantitative data analysis. This research was conducted by providing an e-comic media validation instrument based on integrated problem-based learning Islamic values to material, media, and learning experts.

Analyzing of Data

The feasibility test of electronic comic media based on problem-based learning integrated with Islamic values was carried out using a Research and Development (R&D) approach with the ADDIE model (Analysis, Design, Development, Implementation, and Evaluation) adopted from Dick & Cary (1996). The activities carried out at the analysis stage are analyzing the need for learning media for teachers and students and analyzing learning carried out by teachers. The analysis was carried out to collect the initial data needed to develop problem-based learning-based electronic comic media integrated with Islamic values. The design stage is carried out by designing comic electronic media products based on problem-based learning integrated with Islamic values. The development stage includes recreating comics, digitizing, validating, and revising. The procedure applied in this study only reached the development stage of expert judgment. Guidelines for assessing the feasibility of the instrument using the formula:

$$P = \frac{f}{N} \times 100 \%$$

Information:

- P : percentage number
 - f : score obtained
 - N : overall score
- (Sudjana, 2005)

The percentage of the feasibility of electronic comic media based on problem-based learning integrated with Islamic values can be categorized according to Table 1.

The results of the percentage of media eligibility in the "adequate" and "very feasible"

categories can be used in the science learning process for class VIII Junior High School.

Table 1. Media eligibility criteria

No	Percentage (%)	Category
1.	81 ≤ p ≤ 100	Very worth it
2.	63 ≤ p ≤ 81	Worthy
3.	44 ≤ p ≤ 63	Less worthy
4.	25 ≤ p ≤ 44	Not feasible

RESULTS AND DISCUSSION

The feasibility test results of electronic comics based on problem-based learning integrated Islamic values based on assessment instruments by material experts can be seen in Table 2.

Table 2. Assessment results by material experts

No	Indicator	Percentage (%)	Category
1.	Aspects of the truth of the material or concept	91.43	Very worth it
2.	Concept depth	80.00	Worthy
3.	Breadth of concept	90.00	Very worth it
4.	Execution	80.00	Worthy
5.	Language	80.00	Worthy
Average		84.28	Very worth it

The feasibility test results of electronic comics based on problem-based learning integrated Islamic values in Table 2 show that the assessment by material experts obtained 84.28% data with very feasible criteria. The feasibility test results of electronic comics based on problem-based learning integrated Islamic values based on assessment instruments by media experts can be seen in Table 3.

Table 3. Assessment results by media experts

No	Indicator	Percentage (%)	Category
1.	Language	85.00	Very worth it
2.	Comic anatomy	83.33	Very worth it
3.	Overall view	80.00	Worthy
Average		82.77	Very worth it

Data from the feasibility test of electronic media-based problem-based learning integrated Islamic values in Table 3 by media experts obtained 82.77% with very feasible criteria. The feasibility test results for problem-based learning-based electronic comic media integrated with Islamic values based on assessment instruments by learning experts can be seen in Table 4.

Table 4. Assessment results by learning experts

No	Indicator	Percentage (%)	Category
1.	Material aspect	100	Very worth it
2.	Learning application aspects	100	Very worth it
3.	Language aspect	100	Very worth it
Average		100	Very worth it

Data from the feasibility test by learning experts on problem-based learning-based electronic comics integrated with Islamic values in Table 4 obtained 100% results with very feasible criteria.

Discussion

The feasibility test of electronic comic media based on problem-based learning integrated with Islamic values as a learning medium was based on the ADDIE model (Analysis, Design, Development, Implementation, and Evaluation) adopted from Dick & Cary (1996). Expert assessment serves as a successful process of product feasibility testing that is developed before being tested and used in learning activities. The feasibility of media and design on electronic comic media based on problem-based learning integrated with Islamic values is carried out by considering comments and suggestions from material experts, media experts, and learning experts. According to Arsyad (2017), the principles of visual-based media design consist of simplicity, cohesiveness, emphasis, and balance as a process of media feasibility or the creation of problem-based learning-based electronic comic media products integrated with Islamic values.

Media Eligibility by Material Expert

The feasibility of the media based on the assessment by material experts in Table 2, the average of all indicators obtained is 84.28% with very feasible criteria. The indicators assessed by the material expert include aspects of the truth of the material or concept, the idea's depth, the concept's breadth, implementation, and language. The material and storylines in electronic comics are very compatible with the material of vibrations, waves, and sounds in everyday life. According to (Affeldt et al., 2018), the connection between the material presented in comics and everyday life can help create a more intense learning experience and connect students and the science questions showed. The suitability of the

integration of Islamic values into the material is appropriate.

Images presented in comics must still pay attention to the ideal proportions of the picture. In Figure 1, the slinky image, an example of a longitudinal wave, is less proportional because it is redrawn in a graphic format. Based on suggestions from material experts, it should be changed to Figure 2 only to maintain the image's ideal proportions. The material expert's assessment of the truth aspect indicators of the material or concept is 91.43%, with a very decent category.

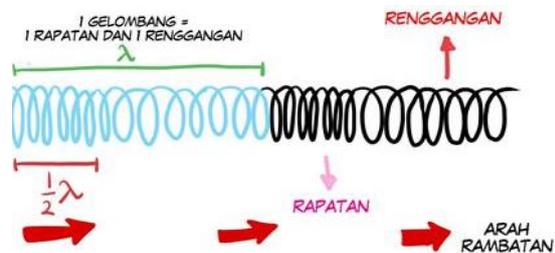


Figure 1. Slinky with graphic design

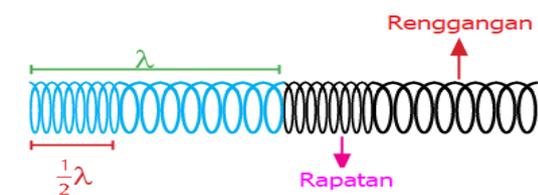


Figure 2. Proportional slinky

There is already a logical relationship between facts, concepts, and theories in the indicator of the depth of concept presented in the electronic comic media. The material presented also has the potential to foster student learning motivation. Teachers' delivery of learning materials in learning activities can affect students' learning motivation (Wood, 2019). The material expert's assessment of the concept depth indicator was obtained at 80.00% with appropriate criteria.

On the indicator of the breadth of the concept, obtained an assessment from material experts of 90.00% with very feasible criteria. In this indicator, the concepts presented are by basic competence 3.11, namely analyzing the concepts of vibration, waves, and sounds in everyday life including the human hearing system and animal sonar systems as well as in basic competence 4.11, namely presenting experimental results on vibrations, waves, and sound. The use of events presented in comics also follows the material of vibrations, waves, and sounds in everyday life.

The implementation indicator received an

assessment from material experts of 80.00% with a decent category. The material presented is easy to understand, offering relevant and exciting concepts and allowing students to seem involved in communication in comics. Learning concepts presented with visual media are easier to understand than those shown with text alone (Brandstetter et al., 2017). Material experts need to pay attention to consistency and follow scientific rules such as writing formulas and units. In the linguistic indicator, the assessment from material experts is 80.00% with a decent category. The presentation of dialogue or story text in comics is very concept-oriented. The language used is easy to understand, and the choice of words for the description of the material is appropriate. Input from material experts so that they can use fonts that are comfortable to read, and some fonts have been changed to use fonts that are suitable for comics so that they are not too formal.

Media eligibility by media experts

The feasibility of the media based on the assessment by media experts in Table 3 the average of all indicators obtained 82.77% with very feasible criteria. The indicators assessed by media experts include language, comic anatomy, and overall appearance. In the linguistic indicator, the results of the assessment are 85.00%, with very decent criteria. Electronic comics already use communicative language that is following the language of students. The presentation of language in comics does not cause double meaning. The language used can create a sense of pleasure when reading it and encourage students to read thoroughly. This is related to the advantages of comics: reading them is not bound by time, creating a sense of comfort when reading, as if the reader communicates directly and becomes part of the comic narrative (Derbel, 2019).

The comic anatomy indicator received an assessment from media experts of 83.33% with very decent criteria. Comic titles, reading panels and word balloons in electronic comics are well presented. The word balloons and the fonts in the word balloons can be read clearly. Word balloons play an essential role in delivering the material presented in the form of a story. Students who read comics experienced eye movement processes to understand the contents of the text in word balloons (Foulsham et al., 2016). Word balloons and image expressions function as a medium of communication between readers and

comics (Farinella, 2018). The presentation of illustrations in this electronic comic has led to an understanding of the concept. The proportion of existing comics is suitable for entertainment and educational communication tools.

The overall display indicator gets an assessment from media experts of 80.00% with proper criteria. Comic covers and comic page designs have been presented with attractive colors, characters, and fonts for displaying electronic comics. The presentation of sharp colors and illustrations can serve as a striking contrast to refresh the comic appearance (Dallacqua & Peralta, 2019). Most of the fonts and font sizes are legible. Suggestions from media experts for Figure 3 regarding the ear organs to clarify the writing to be read correctly.

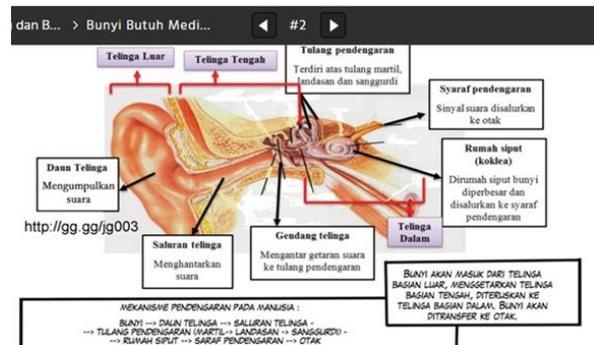


Figure 3. Ear organs

Media Eligibility by Learning Experts

The feasibility of the media based on the assessment by learning experts in Table 4 the average of all indicators obtained 100.00% with very feasible criteria. The indicators assessed by learning experts include material aspects, learning applications, and language aspects. In the temporal aspect indicators, the assessment results are 100.00%, with a very decent category. The material presented in electronic comics is very in line with the learning objectives and the material of vibrations, waves, and sounds in everyday life. The scope of the material presented is by the learning competencies. The material presented is very relevant and exciting and has a given storyline. The images shown in electronic comics are also by the material of vibrations, waves, and sounds in everyday life.

In the learning application indicators, the assessment from learning experts is 100.00% with very decent criteria. The contents of the comic electronic media trigger students to discuss solving problems. Comics can start student involvement to solve problems (Brandstetter et al., 2017). Comic electronic media is efficient to

use in learning. Digital comics can increase the effectiveness of learning activities (Riwanto & Wulandari, 2018). Comic electronic media also has the potential to foster student learning motivation. The illustrations presented in the comic electronic media are very much directed towards understanding the concept. Attractive images and simple funny language can help students understand abstract and complex concepts more easily (Toh et al., 2017).

In the language aspect indicator, the assessment from learning experts is 100.00% with very decent criteria. The language used in electronic comics is easy to understand, and there is no double interpretation of each word used. The language used is also very communicative. Suggestions from learning media experts, there are still some typos to be noticed and corrected. Based on the feasibility test from material experts, media experts, and learning experts, the results of this study state that problem-based learning-based electronic comics integrated with Islamic values are worthy of being tested to be used as learning media for vibration, waves, and sounds in everyday life.

CONCLUSION

The feasibility test of electronic comic media based on problem-based learning integrated with Islamic values based on the ADDIE model (Analysis, Design, Development, Implementation, and Evaluation) has been feasible to be tested before which will be used as a medium for learning science for class VIII on vibration, waves, and sounds in life daily. The results of the feasibility test of electronic comic media based on problem-based learning integrated with Islamic values obtained data of 84.28% with very feasible criteria for eligibility by material experts, based on aspects of the truth of the material or concept, depth of concept, breadth of concept, implementation, and language. The feasibility assessment by media experts obtained data of 82.77% with very feasible criteria based on linguistic aspects, comic anatomy, and overall appearance. The feasibility assessment by learning experts got 100.00% data with very feasible criteria based on material aspects, learning applications, and language aspects.

ACKNOWLEDGEMENTS

This research was funded by DIPA Universitas Negeri Semarang Number: SP DIPA-023.17.2.677507/2021 with a Thesis Grant

Research Agreement Letter Number 80.19.5/UN37/PPK.5.1/2021. The author would like to thank LP2M Universitas Negeri Semarang for the support and facilities provided.

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