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Feasibility Test of E-Comics as a Value-Based Tuberculosis Education Media for Islamic Education in Grade 8 Students of Muhammadiyah Junior High School Jakarta

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Abstract

This study aims to determine the validity/feasibility of electronic comic development products as learning media in education on tuberculosis transmission prevention based on Islamic education values in grade VIII of Muhammadiyah DKI Jakarta Junior High School. This research is a research and development or Research and Development (R&D) from Borg and Gall for the information collecting data stage and the learning product development stage using Dick and Carey model development steps. Researchers use *sequential exploratory* strategies. The results of the analysis of material eligibility criteria, media feasibility, religious eligibility and language eligibility. Assessment of material feasibility 95.5%, Media Feasibility 93.33%, Religious Feasibility 100%, and Language Feasibility 94.4%. The average

feasibility is 95.81%. % of the eligibility criteria for user response obtained is good. Feasibility tests were also carried out on students with individual trials (*one to-one learner*), obtaining an average score of 2.95 and the percentage value was 95.83%, namely comic education in learning materials using words that are easy to understand to facilitate the understanding of the material. The aspect of the design of educational materials is quite entirely and worthy of publication, with an average score of 2.69, and the percentage value is 68.83%. Based on the results of data analysis, it can be concluded that E-Comic media is suitable to be used as a learning medium in education on tuberculosis transmission prevention.

Keywords: Educational Media, E-Comics, Values, Islamic Education, Eligibility

Introduction

Indonesia is still the country with the third most significant burden of tuberculosis (TB) disease in the world after China, with an estimated 824,000 cases with 13,110 deaths and only 47% of reported cases, according to the World Health Organization (WHO, 2021) ^[9]. Global and National Commitment to ending Tuberculosis is outlined in the End TB Strategy, which targets a reduction in deaths from Tuberculosis to 90% by 2030 compared to 2015, a reduction in the incidence of Tuberculosis by 80% in 2035 compared to 2015 (Ministry of Health of the Republic of Indonesia, 2021)

Children associated with positive adult TB cases are at increased risk of transmission. The case index shows the transmission rate, 13 and 40% of school classes, defined as casual contacts. Close contact increases the risk of infection. Exposure from adult teachers with positive cases of sputum causes 28-52% of infected children to be in close contact (Debulpaep *et al.*, 2020) ^[2].

Children are a period at an age quite vulnerable to disease transmission. When the child is infected, it is easy for them to get tuberculosis. Children can contract or contract TB infection starting from having direct contact or at home with TB sufferers sourced from parents (adults) within a few hours. Adolescents are part of the youth who are vulnerable to health problems, at this stage of adolescent development, it is essential to maintain health. Therefore, providing health education to adolescents is needed to change attitudes, behaviors, and habits in their daily lives (WHO, 2021) ^[9].

The provision of learning through education is one way to increase knowledge. Increased knowledge can occur if students are involved in the learning experience. Involvement in learning means that it will require students to participate in making a decision throughout their learning process. This needs to get the support and participation of teachers and researchers to develop knowledge in improving science, especially science about Prevention of Tuberculosis Transmission through Comics.

The era of the Industrial Revolution 4.0 requires most components of society to develop capabilities in processing information technology, one of which is the realm of education. Every element in the realm of education must be familiar with rapidly growing technology. Digitalization of education is a matter of educational innovation. One of the variations in the learning

process is using technology-based media. (Emalia & Farida, 2019 in (Mery, 2022) [6]. This comic media is an educational media to facilitate screening and obtain data on children affected by TB. This comic media contains TB knowledge, how to transmit TB to children, recognize the signs of TB symptoms in children, and how to treat TB in children. This comic media is made as interesting as possible so that children are easy to understand and not boring to read when screening later.

Comics based on *Contextual Teaching and Learning* (CTL) as a learning medium received a good response from students, with a percentage of 90.5%. Therefore, it can be concluded that CTL-based comics are reasonable, practical, and effective for improving learning outcomes in social studies subjects of third-grade students in elementary schools (Rosyida, Mustaji, & Subroto, W, 2017) [8].

This contextual-based comic media is very feasible to be used in the learning process. that The results of comic media are feasible to be applied as evidenced by the results of the 95% learning content expert test, 90% learning design expert, 82.69% learning media expert, 90.36% individual test, 91.66% small group test, and 93.40% field test (Melliyanti & Suniasih, 2022) [5].

Comic media oriented to the constructivist approach has excellent validity in aspects of content and learning media with percentages obtained 90.00% and 92.50%, while the aspect of learning design has good validity with a percentage obtained 87.50%. At the feasibility test stage through a small group, 90.36% were obtained with excellent qualifications (Widyaningsih & Ganing, 2021) [11].

Based on preliminary survey data conducted in 5 Muhammadiyah DKI Junior High School schools, it was found that 100% said there was no special learning about Tuberculosis, so far there was Biology learning that only existed about discussing body systems in general, namely the respiratory system, for tuberculosis discussion there was none, but there was literacy given on certain days but nothing related to Tuberculosis.

The novelty of the developed media is by creating comic media based on Islamic educational values that can be used by teachers in offline and online learning that can be accessed by students independently through mobile phones that run on mobile devices in the form of cartoon-shaped graphics with Islamic Education values highlighted to deliver Tuberculosis Prevention Education materials. This comic application with the name I-TBE Comics supports android and IOS (Iphone Operating System).

The purpose of this development research is to determine the feasibility of comic learning media in education on tuberculosis transmission prevention based on Islamic education values in Grade 8 Students of Muhammadiyah DKI Jakarta Junior High School.

Methods

This research is a research and development or Research and Development (R&D) from Borg and Gall for the information collecting data stage and the learning product development stage using Dick and Carey model development steps. Researchers use *sequential exploratory* strategies, in the first stage researchers collect and analyze qualitative data then collect and analyze quantitative data.

The development model of *Borg & Gall* developed on the study is 6 steps. In its development, Borg and Gall recommended developing learning products using learning

tools with *Dick and Carey's* instructional system design. In these product development recommendations, *Dick and Carey* (2015) have 10 stages that are interrelated between components and continuous, these stages are: (1) Identify general Instructional objectives; (2) instructional analysis can be carried out in parallel at the third stage; (3) learner analysis; (4) writing of specific instructional objectives; (5) revise instructional; (6) develop assessment instruments; (7) development of instructional strategies; (8) develop and select instructional materials; (9) design and carry out formative evaluations; (10) design and build summative evaluations. (*Borg W R & Gall M D*, 2007) [1].

Results

Validation of learning materials Tuberculosis prevention education designed, reviewed by material experts, namely about Tuberculosis, and linguists by linguists related to the language used in the story, design experts on educational models for tuberculosis transmission prevention in the form of E-Comics by comic media experts and for the value of Islamic education by religious experts. Validation carried out by the experts mentioned above to obtain the feasibility of E-Comics products as well as input and suggestions.

Based on the assessment of validity from material experts, media experts, religious experts and linguists on E-Comics Prevention of Tuberculosis Transmission based on Islamic education values can be seen in the validation score analysis in Table 1

Table 1: Validation Analysis of Material Experts, Media Experts, Religious Experts and Linguists

S. No	Assessment Aspect	Percentage	Validation criteria
1.	Feasibility of the material	95,5 %	Valid/Eligible
2.	Media Eligibility	93,33%	Valid/ Eligible
3.	Religious Eligibility	100%	Valid/ Eligible
4.	Language Eligibility	94,4%	Valid/ Eligible
	Average	95,81%	

The results of the analysis of eligibility criteria, material assessment, media, religion and language obtained an average of 95.81% so that they were matched in the criteria in Table 1 have valid criteria that the Product can be continued by adding something lacking, making certain considerations, the additions made are not too large, and not basic.

Feasibility tests were conducted on students with individual trials (*one to one learner*) conducted with 3 students each in 5 schools of Muhammadiyah DKI Jakarta Junior High School, 1 student representing achievement with less ability, 1 student representing medium achievement, and 1 student representing high achievement. Based on limited trials on comic teaching materials, it can be seen in Table 2, table 3 and Diagram 1 as follows:

Table 2: Clarity aspect of material based on average score of One to One

S. No	Clarity of the Material	Mean
1	Competency compliant material	3.00
2	Understanding Tuberculosis	2.93
3	Symptoms of Tuberculosis	3.00
4	Risk Factors for Tuberculosis	2.87
5	Tuberculosis Transmission	3.00
6	How to treat tuberculosis	3.00
7	Handwashing Demonstration	2.93

8	Demonstration of Cough Ethics	2.93
	Average Score	2.95
	Average percentage	95.83 %

Students assess that the material from the Tuberculosis Transmission Prevention Education based on Islamic education values in the form of E-Comics is in accordance with student needs by obtaining an average score of 2.95 and the percentage value is 95.83%, namely comic education in learning materials using words that are easy to understand so as to facilitate the understanding of the material. The sentence structure is complete and the points of thought of each sentence are clear and easy for students to understand. The story is easy to understand and the elaboration or development of meaning from sentence to sentence to the next sentence is clear and easy to understand. I really like the comic, especially from the first time I saw it with the layout design in the form of a comic that was very interesting so that the enthusiasm with the comic. The test subjects said they were happy because many examples of design drawings fit tuberculosis material. Clarity of educational materials for Prevention of Tuberculosis Transmission based on Islamic education values in the form of E-Comics using words that are easy to understand. Then the context / scope of the material is interrelated and facilitates understanding.

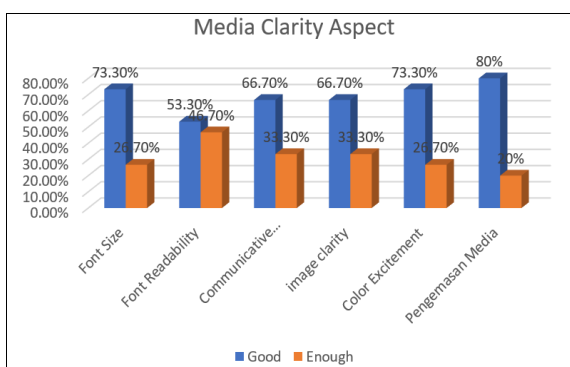


Fig 1: Media Clarity Design Assessment Score Student one to one test Media Clarity Aspect

Table 3: Media Clarity Aspect based on the average score of the One to One Test

S. No	Media Clarity	Mean
1	Font Size	2.73
2	Letter readability	2.53
3	Communicative Language	2.67
4	Image clarity	2.67
5	Color Attractiveness	2.73
6	Media Packaging	2.80
	Average Score	2,69
	Average percentage	68.83%

Physically, the appearance of comics is attractive and can help students to understand educational materials on tuberculosis transmission prevention based on Islamic education values. Making it easier for students to understand the material and making students motivated to read through E-Comic media. Overall, the aspect of educational material design is quite valid and worthy of publication with an average score of 2.69, and the percentage value is 68.83%.



Fig 2: Final Product Image Physical Model E-Comics Education

The physical model produced in the development of an educational model for preventing tuberculosis transmission based on Islamic education values in the form of E-Comics: Standard Operating Procedures (SOP) in the use of I-TBE Comic Application media as an educational learning guideline.

Discussion

The importance of a Development of Learning Tools in the Development Process In the quality of learning, a learning model is adapted to the behavioral conditions and characteristics of students. Teenage learners lately have a tendency to use electronic media more than print media/books. Comics can be interpreted as a text cartoon image capable of conveying a message in a light and fun style. Adopting a style of comic media which is packaged with digital-based mobile devices to convey learning messages makes an alternative to the development of learning media. A form of media that is not too rigid from the development of digital comics (E-Comics) based on mobile devices can be expected to be a delivery of educational learning media that is certainly fun for students so that it can motivate to learn educational learning content that is a message to be conveyed. Comics (E-Comics) as a learning medium and adopted its style to deliver educational materials.

Developments in science and technology indicate continuous adjustment and improvement of the learning process. In addition, there is a need for innovation in learning to improve the quality of graduates who are ready to use in the world of work, One of the learning models is electronic comics (e-Comics). The initial concept of comic development was made in the form of a story with paper media. Along with the development of technology, digital-based comics are developed through application software that is considered more effective because it can be planted in gadgets such as mobile phones.

The light language style of this comic media is favored by teenagers. For this reason, the electronic media comics developed are aimed at the target users of junior high school students. that suits the needs and characteristics of students. In the learning process students have 3 characters, namely visual or children will more easily understand the material with the help of image media, auditorial or children will more easily understand the material with the help of sound and kinesthetic media or children more easily understand the material with direct activities/practicum (Evelyn Kogizi Kahigi, 2008) [4]. Learning media helps to change material into concrete is visual media, so that material that was

originally in the form of reading text can be visualized or illustrated with images on learning media. A comic is a lined array of images complemented by supporting story text (Scott McCloud, 1993)^[7].

E-comics learning media based on Islamic educational values on the material Prevention of tuberculosis transmission in grade 8 junior high school is feasible and used in the learning process seen from several aspects. First, the material aspect, the media material presented has paid attention to the compatibility between basic competencies, indicators, and learning objectives in comics. Some indicators that must be met to analyze media validation are the suitability of media material with learning material, basic competencies, indicators and learning objectives, a balance between the presentation of material content and learning objectives, and language selection tailored to student characteristics according to Daryanto, 2016; Manurung & Panggabean, 2020 in (Melliyanti & Suniasih, 2022)^[5].

Based on the validation results, the form aspect is classified as valid or feasible. Validity in the aspect of form shows that the e-comic media has clear images, neat layouts, and non-blurry images. E-comic media uses sizes and fonts that make it easy to read. From The layout in the e-comic media has been arranged interestingly. The images displayed by e-comics are clear, neat, and not blurry. The images displayed in the media must be clear and able to represent the material in question (Habibati *et al.*, 2019 in (Mery, 2022)^[6].

Excellence in a comic as a learning medium is able to increase the value of student characters, increase learning motivation, make learning better (Khasanah, 2021; Saputro, 2015; Utariyanti, 2015; Widyawati, 2015 in (Widyaningsih & Ganing, 2021)^[11]. The implication of this research is the development of E-comic media oriented towards Islamic educational value approaches that can be developed on science subject matter and other subjects other than science and must be adjusted to the learning content.

That comics are created through a combination of images and other photos, so the electronic comics presented are visual aspects in the form of images and text so that students can choose the way of learning they like and can make students more interested in reading so that the material presented in electronic comics is conveyed.

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