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Developing E-Comic Media for Teaching the History of the Banten Kingdom in High Schools

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ABSTRACT

History learning in Indonesian high schools often relies on conventional methods, which can reduce students' motivation and engagement. To address this issue, this study aimed to develop an innovative e-comic as a digital learning medium for teaching the history of the Banten Kingdom. The research employed a Research and Development (R&D) approach using the Sugiyono model, consisting of four stages: needs analysis, product design, expert validation, and revision. Data were collected through interviews, questionnaires, and classroom observations involving one history teacher and ten Grade X students at SMA Muhammadiyah At Tanwir Metro. The prototype was evaluated by two material experts, two media experts, and students as end users. The needs analysis revealed that existing history learning media lacked variety and technological integration, leading to low student interest. The developed e-comic integrates narrative, visuals, and interactive features, including audio and digital navigation. Validation results indicated good feasibility: material experts rated the product at 81% (very feasible) after two validation cycles, and media experts rated it at 91% (very feasible). Student responses also showed high acceptance, with most ratings falling in the "highly suitable" category. The findings suggest that e-comics can increase students' engagement and comprehension of historical content by combining visual and textual information, in line with multimedia learning principles. The e-comic on the Banten Kingdom is valid and feasible for classroom use, with potential to enhance historical understanding and encourage the integration of technology in history education.

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1. INTRODUCTION

The foundation of personal advancement and societal improvement lies in education (Anugerah Ash-shidiqqi, 2018; Budiyono & Ngumarno, 2019; YILDIRIM et al., 2018). Through the educational process, a person acquires knowledge, skills, and values that are essential to develop and adapt in an ever-changing world (Kuldas et al., 2013). Education is not only about transferring information, but

also about forming character, ethics, and critical thinking patterns (Özelçi & Çalışkan, 2019)(Seixas & Morton, 2013; Setiawan et al., 2021). An effective education system must be able to respond to the needs of the times, facilitate creativity, and encourage innovation(Nussbaum et al., 2021; Razali et al., 2018; Warsah et al., 2021). Without quality education, social and economic disparities will widen, hampering the potential for sustainable growth and development(Sung, 2020).

History subjects have an important role in education because they help students understand the development of human civilization, both from political, economic, social, and cultural aspects(Anis et al., 2020; Grever & Adriaansen, 2019; Mamoura, 2013). Through studying history, students can see how past events have shaped the world they live in today. It is not just about memorizing dates and facts, but also about analyzing the causes and effects of events, understanding the wider context, and drawing lessons from past experiences (Bunari et al., 2024; Fahruddin et al., 2022; Pertiwi et al., 2023; Sakki & Pirttilä-Backman, 2019). Asmara (Asmara, 2019) also emphasized that history is the oldest subject compared to other social science disciplines, in fact, history education has been taught in schools since the colonial era, after independence, until now. History subjects are lessons that study life in the past (Abbas et al., 2022; Abdurakhman & Rahman, 2021; Adli & Fatimah, 2019; Rohman et al., 2021; Takenaka & Soga, 2019).

As technology develops, the world of education requires innovation in various fields. Both in terms of equipment and infrastructure. The 21st century marks the transition to the digital era or Industrial Revolution 4.0 (Brew & Saunders, 2020; Fahmi et al., 2019; Turiman et al., 2012), where human activities, including learning media, can be virtualized to achieve learning goals. Learning technology in Indonesia is increasingly developing along with the times. Education plays a very important role in achieving national development in Indonesia. Through education, we can develop human resources and improve their qualifications, as well as develop the next generation who are able to build the country and nation in a better direction in the future. Therefore, education and improving human resources in Indonesia must also be in line with developments in science and technology (Puspitarini & Hanif, 2019).

Firmadani (Firmadani, 2020) also highlighted that the era of the Industrial Revolution 4.0 is characterized by the integration of technology into nearly all aspects of life, including education. The growth of technology-based learning tools has enabled teachers to deliver instructional content without the need for face-to-face interaction (Hernández-Ramos & De La Paz, 2009; Patra et al., 2022; Sayono et al., 2020). These digital learning tools enhance both the effectiveness and efficiency of the educational process. A variety of technology-driven media—such as audio, visual, and audiovisual formats—can be utilized to support teaching and learning activities. These types of media can be incorporated into various subject areas, particularly within the context of history education (Puspitarini & Hanif, 2019; Tanggoro, 2015) .

An educator has an obligation to continue to innovate the learning media he uses. Technology-based learning media has many advantages. This can not only stimulate students' interest in learning but also improve their learning outcomes. Such as using E-Comics as a learning medium because E-Comics is very interesting (Rahmawati et al., 2021). E-Comics media is not only used as a textbook but as an alternative to refresh learning in the classroom which tries to make students interested in history subject matter and explore knowledge. Apart from that, it can also be used as a media for learning history(Ofianto et al., 2023, 2022; Van Drie & Van Boxtel, 2008).

Based on the results of a preliminary survey conducted at the high school level, it was found that history learning continues to face several challenges, particularly in the use of technology-based learning media. History instruction remains dominated by conventional methods such as lectures and discussions, supported primarily by limited media such as textbooks and basic presentation materials. This traditional approach has contributed to a lack of student engagement and reduced motivation to explore historical content in depth. Feedback from students indicates that the limited variety in learning resources leads to boredom and disinterest, with many still relying solely on textbooks, despite a preference for more interactive and visually engaging media, such as illustrated books or digital tools.

Advancements in educational technology offer significant potential for innovation in history education. One such innovation is the use of interactive digital media, including electronic comics (e-comics), which integrate visual and narrative components to enhance material comprehension in an engaging manner (Murniviyanti & Marini, 2021). Despite these advantages, there remains a lack of e-comic-based learning media specifically designed to present the history of the Banten Kingdom. E-comics have been shown to improve student engagement and retention by presenting historical events, characters, and chronologies in a more dynamic and accessible format (Komang et al., 2021; Kristiyanto & Rahayu, 2020).

In response to these issues, this study aims to develop and validate an e-comic as a learning medium for teaching the history of the Banten Kingdom to high school students. This digital media is expected to help students understand historical material in a more enjoyable and motivating way. By incorporating visual elements and digital technology, the e-comic is designed to provide an interactive, relevant, and pedagogically effective learning experience that enhances history education in secondary schools.

2. METHODS

2.1. Development Model

The research method used is R&D, where this research will produce certain products, and test the activity of these products. The researcher intends to develop a learning product in the form of an E-comic, specifically designed to teach the history of the Banten Kingdom. The development model used in this research is a development adapted from Sugiyono's research(Sugiyono, 2020).

2.2. Development Procedures

The development research phase focuses solely on testing product designs internally by gathering input from a team of experts. This team includes content specialists and media experts, comprising history education lecturers from Muhammadiyah University of Metro, history subject teachers, ICT (Information and Communication Technology) teachers, as well as 10 students from SMA Muhammadiyah At Tanwir Metro. To select the expert team for design evaluation, the researchers employed purposive and snowball sampling techniques—methods that involve selecting participants based on specific criteria(Djamas et al., 2018).

Once the product is deemed feasible by the experts, it proceeds to the next phase, which involves feedback from respondents who represent the target users—students. These respondents are asked to evaluate the product by completing a questionnaire containing statements related to its development (Kwangmuang et al., 2021). The trial involves 10 student respondents. However, before the product is finalized for use, it must undergo internal testing. This internal testing is conducted in two phases: stage one and stage two.

2.3. Instruments for Gathering Data

2.3.1. Expert Team Validation Instrument

Used by the expert team serves to evaluate the product under development, ensuring that the data collected can help address existing issues (Aman, 2019a; Ofianto et al., 2022; Wijnen et al., 2021). This data is expected to contribute to improving the product's effectiveness, appeal, and efficiency. The validation tools were distributed to both content experts and media specialists(Setiawan et al., 2021).

2.3.1.1. Material Expert Validation Instrument

This instrument is presented as a questionnaire designed to evaluate the relevance and accuracy of the e-comic content. It is administered to two content experts who assess how well the material aligns

with learning objectives. The evaluation focuses on the suitability of the material's content and the correctness of the language used.

Table 1. Material Expert Instrument Grid

Aspect	Assessment Item	Total Items
Eligibility	1. The e-comic content aligns with the CP, ATP, and established indicators	1
	2. The material demonstrates appropriate density and relevance.	1
	3. The content is presented clearly and is easy to comprehend	1
	4. The material's accuracy is supported by valid scientific principles	1
Peresentation	5. The title presentation corresponds appropriately with the material content	1
	6. Images are presented in alignment with the subject matter.	1
	7. Subtheme explanations are relevant and connected to the material.	1
	8. The conclusion section is consistent with the overall content.	1
	9. The bibliography is properly presented and reflects the sources referenced.	1
Language	10. Language use adheres to appropriate and correct grammar rules	1
	11. The language used is simple and easily understood.	1
	12. The language complies with standard Indonesian spelling conventions	1
	13. Paragraphs are logically structured and consistently accurate.	1
E-Comic Assessment	14. The historical topics are presented and discussed to strengthen students' understanding of the subject.	1
	15. This e-comic is suitable for independent study without teacher assistance	1
	16. The content helps enhance students' understanding of history.	1
	17. The material supports students in developing autonomous learning skills.	1

2.3.1.2. Media Expert Validation Instrument

This instrument is designed as a validation questionnaire for product development and is administered to two media experts. These experts evaluate the feasibility of the product by reviewing elements such as visual design, typography, and color usage.

Table 2. Media Expert Instrument Grid

Aspect	Assessment Item	Assessment amount
Cover Design	1. The e-comic cover has a neat and pleasant design	1
	2. The e-comic looks attractive overall	1
	3. The cover colors are engaging and well-chosen	1
	4. The focal point of the visual display is well-composed and balanced	1
	5. The arrangement of cover layout elements is visually consistent and harmonious.	1
	6. The placement and proportion of key layout components (such as the title and image) are appropriate and consistent.	1
	7. The e-comic is user-friendly and simple to navigate	1
	8. The illustrations in the e-comic are clearly visible.	1

Design Aspects	9. The use of different font styles (bold, italic, and size) is balanced and not overused	1
	10. Font size, type, and margin spacing are clear and readable	1
	11. Paragraph spacing is consistent and easy to follow.	1
	12. The images are relevant and aligned with the content being discussed.	1
	13. Images are arranged with suitable titles, texts, and numbering.	1
	14. Image sizes are well-proportioned and accompanied by appropriate captions	1
	15. The positioning of text and images is well-aligned and visually harmonious.	1

The subsequent step in this study involved using a Likert scale to analyze the evaluation results. This scale is commonly applied in the development of research instruments to measure attitudes, perceptions, and opinions. Below is a table of the Likert scale and its corresponding score weights as outlined by Sugiyono (Sugiyono, 2020):

Table 3. Likert Scale

Category	Score
Strongly agree	5
Agree	4
Undecided	3
Disagree	2
Storngly disagree	1

The resulting percentages are utilized to assess how well the product aligns with the predetermined criteria. To determine the product's overall viability, the researcher applies a classification system that reflects different levels of feasibility. This framework includes five distinct categories, each characterized by a defined percentage range spanning from 10% to 100%. The feasibility categories, as proposed by Arkianto, are detailed in the table below:

Table 4. Eligibility Category

Percentage (%)	Interpretation
>21%	5
21%-40%	4
41%-60%	3
61%-80%	2
81%-100%	1

This study employed qualitative methods for data collection. Techniques associated with qualitative approaches include observation, interviews, questionnaires, and documentation (Aman, 2019b; Ashaver, 2013). The methods used in this research are described as follows: (a) Observation**,** conducted at SMA Muhammadiyah At Tanwir Metro to gain an understanding of the school environment; (b) Interviews**,** held with history teachers and several tenth-grade students to gather insights; (c) Questionnaires**,** utilized during the product evaluation and trial phases, and distributed to content and design experts, including history lecturers from Muhammadiyah Metro University, history teachers from SMA Muhammadiyah At Tanwir Metro, and 10 students for internal testing purposes; (d) Documentation**,** involved collecting supporting materials such as photographs of cultural heritage, validation questionnaire data, and images of the internal testing process.

3. FINDINGS AND DISCUSSION

3.1. Needs Analysis

3.1.1. Details of History Instructional Resources

Based on the research conducted at SMA Muhammadiyah At Tanwir Metro, the researchers analyzed the findings and identified the core issue: the need for improved learning resources, particularly in history subjects, that incorporate modern technological advancements. The types of digital learning tools considered essential and in demand at the school include e-books, e-modules, and flip books. One such resource being developed by the researchers is a digital comic (e-comic). In response to this need, the researchers created a learning resource in the form of an e-comic that presents historical content related to the heritage of the Banten Kingdom. This e-comic is designed to be accessible via Android smartphones, allowing students to engage with the material anytime and anywhere.

3.1.2. Design of the Product to be Created

Based on the needs analysis conducted by the researchers and observations of field conditions, there is a demand for learning resources that present historical content in line with technological advancements. Therefore, the researchers developed an e-comic containing the relevant material: Biographies of historical figures relevant to the Banten Kingdom, the role of the kingdom in the spread of Islam in Indonesia, the influence of trade in the development of the kingdom, important figures and their contributions to history, the impact of the kingdom's existence on the development of culture and religion in the archipelago. The arrangement of the contents of the e-comic material: (1) Cover containing the image and title of the comic. (2) Instructions for use to make navigation easier. (3) Learning Achievements and Learning Objectives according to the history curriculum. (4) The main material is presented in the form of interactive comics. (5) Practice questions to test students' understanding. (6) Author profile as part of source credibility. (7) Bibliography as a scientific reference in preparing material.

3.1.3. E-Comic design

The illustration above shows the front cover of the e-comic currently being developed. Its design is intended to enhance visual appeal by combining vibrant colors with customized graphic elements. The cover prominently features the title and highlights the regional settings of the buildings included in the e-comic. On the inside cover, details such as the e-comic’s title, the Muhammadiyah Metro University logo, the author’s name, and the affiliated institution are presented.

3.1.4. Demonstration of Development Outputs

The developed e-comic then proceeded to the validation stage, involving both content and media experts. Mrs. Elis Setiawati, M.Pd, a history lecturer and Mrs. Rosdina, S.Pd, a history teacher at SMA Muhammadiyah At Tanwir Metro conducted content validation. Media validation was carried out by Mr. Bahtiar Afwan, M.Pd, a history lecturer, and Mr. Abu Hanifah, S.Pd, an ICT teacher at the same school.

During the validation process, each expert filled out a questionnaire provided by the researcher by marking (√) the appropriate score column, based on the given statements. On the other hand, students completed their evaluations through a Google Form by selecting the numerical value corresponding to each assessment statement. The completed questionnaire data were then analyzed using the formula outlined in Chapter III, including the calculation of feasibility percentages.

3.1.4.1. *Material Expert Validation*

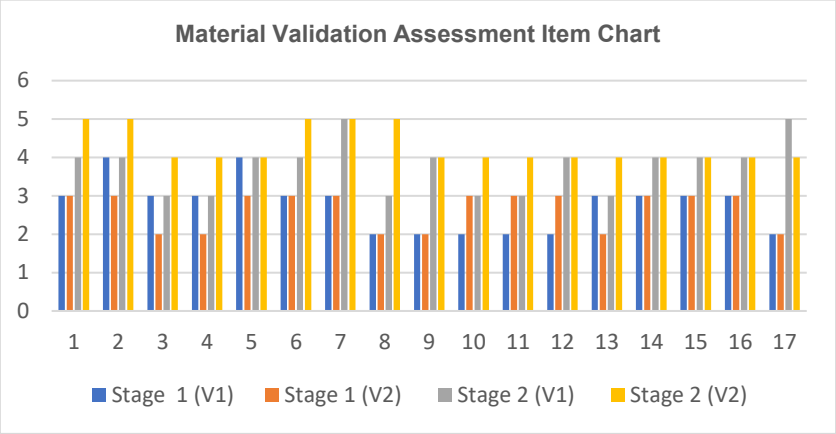

Figure 1. Graphic of material validation assessment items.

The figure above displays the results of individual assessments. In the first stage, lower scores were observed in assessment items 8, 9, and 17, which fall under criterion 4. These results indicate that those particular aspects required revisions based on the feedback provided. Consequently, revisions were made, followed by a second round of validation. In stage 2, notable improvements were seen in the graphic quality of items 8, 9, and 17. However, during this second stage, lower scores were recorded for assessment items 3, 4, 10, 11, and 13. The highest score in stage 2 was achieved in assessment item 7. Overall, the graph suggests that the validation results in stage 2 showed improvement compared to stage 1.

The following graphs show the evaluation results for each assessment item. Additionally, the average scores from the material validators in both validation stages are presented in the table below:

Table 5. Information regarding the initial material validation stage

Validator Assessment	Assessment Scores Count	Eligibility Mean Value	%	Explanation
1	48	0.57	56%	Can be utilized following revisions in accordance with the provided suggestions.
2	46	0.53	53%	Can be utilized following revisions in accordance with the provided suggestions.
Total score	93	0.55	55%	Can be utilized following revisions in accordance with the provided suggestions.

Based on the data table showing the results of the first stage of material validation, Validator 1 provided a total score of 48, with an average feasibility rating of 0.56 and a percentage of 55%. This places the product in the "fairly suitable with revisions" category, based on the suggestions provided. Similarly, Validator 2 gave a total score of 46, with an average feasibility score of 0.53 and a percentage of 53%, which also falls under the "fairly suitable with revisions" classification. Combined, the total score from both validators was 93, resulting in an average feasibility rating of 0.55 and an overall percentage of 55%. Therefore, the product is considered moderately feasible for use, provided that the suggested revisions are implemented. The first stage of validation also included feedback and recommendations from both material validators, as outlined below:

Table 6. Comments and suggestions first stage.

Material Expert Validator	Comments and Suggestions
Validator 1	The material is not yet ready for use and requires revision, particularly in the numbering arrangement of each image depicting building variations to facilitate the e-comic's organization
Validator 2	The writing quality of the e-comic is fairly good
	It is recommended that the title include a clearer indication of the term 'E-comic' for better understanding
	The bibliography appears to be more tailored or adapted, but may benefit from standardization
	The conclusion section is now presented with greater clarity

Based on the table containing comments and suggestion, the researcher revised the developed e-comic in line with the feedback received, with the goal of enhancing its quality and achieving greater feasibility. Following these improvements, the researcher proceeded with the second stage of validation. The results of this second validation stage are presented in the following table:

Table 7. Information regarding final material validation

Validator Assessment	Assessment Scores Count	Eligibility Mean Value	%	Explanation
1	65	0.76	76%	Worth using with revisions
2	75	0.86	86%	Very worth using
Total score	138	0.81	81%	Very worth using

Based on the data table showing the results of the second stage of material validation, Validator 1 gave a total score of 65, with an average suitability score of 0.76, corresponding to 76%, which falls into the category of "suitable for use with revisions." Validator 2 provided a total score of 75, with an average feasibility rating of 0.86 and a percentage of 86%, indicating the product is "Ideal for Utilization." The combined total from both validators was 138, with an overall average feasibility score of 0.81 and a percentage of 81%. Therefore, the product is considered highly suitable for use based on the evaluation results.

Table 8. Comments and suggestions second stage

Material Expert Validator	Comments and Suggestions
Validator 1	Suitable for implementation following slight modifications.
Validator 2	The e-comic aligns with the subject matter being discussed, and its title accurately represents the material's content.
	Validator 2 stated that the e-comic's composition is appropriate for use as an educational resource.

Feedback and suggestions from Material Validators first and second during the second validation stage, both validators confirmed that the e-comic developed by the researcher was deemed suitable for use. As a result, the researcher was able to move forward to the next phase, which involved finalizing the e-comic design and preparing it for validation.

3.1.4.2. *Media Expert Validation*

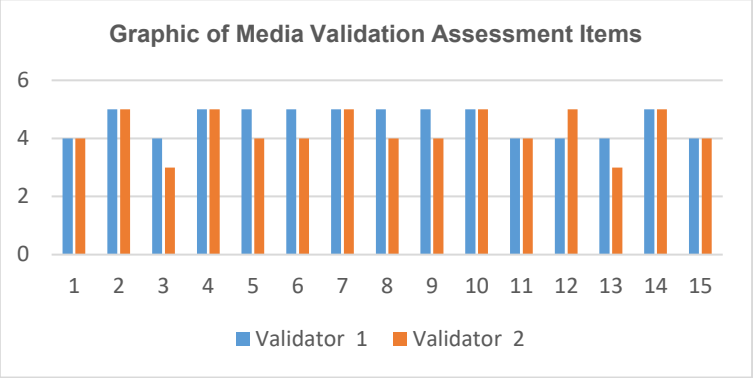

Figure 2. Graphic of media expert assessment items.

The graph shows that validation by media experts took place in one stage, as both the first and second validators agreed that the media aspect of the developed e-comic was highly appropriate for use across all evaluation criteria. Each validator provided similar ratings, with the highest scores falling under criterion 5, "strongly agree," and the lowest under criterion 3, "neutral" or "uncertain," as shown in the graph above. Since the validators considered the media design of the e-comic to be highly appropriate and aligned with the evaluation criteria provided by the researcher, only one round of validation was deemed necessary. The following table presents the average ratings given by Media Validators First and Second.

Table 9. Media expert validation data

Validator Assessment	Assessment Scores Count	Eligibility Mean Value	%	Explanation
1	70	0.93	93%	Ideal for Utilization
2	64	0.85	85%	Ideal for Utilization
Overall	137	0.91	91%	Ideal for Utilization

3.1.5. Respondent Data

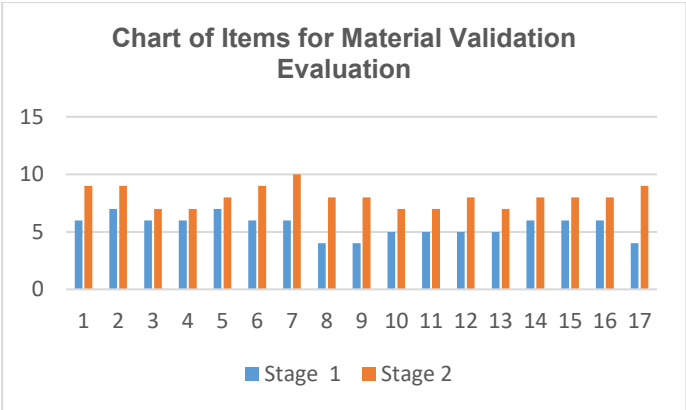

Figure 3. Indicators of Respondent Evaluation

The Figure above demonstrates the students' improvement during the small group trial stage through the use of the e-comic created by the researcher. According to the data, the highest rating given by students reached a score of 100%, placing it in the "highly suitable for use" category, with five students awarding the e-comic this top score. The lowest rating, given by one student, was 60%, which falls into the "fairly suitable for use with revisions" category. Other students gave ratings of 80%, 85%,

and 90%, all of which also fall under the "highly suitable" classification. These findings indicate that, on average, students responded to the developed e-comic in a way that categorizes it as highly appropriate for use.

3.1.6. Product Revision

The creation of the e-comic covering the History of the Banten Kingdom involved multiple stages to produce a product deemed valid and appropriate for use, based on evaluations from both content and media experts. The products developed by the e-comic underwent revisions, revisions were made based on criticism and suggestions provided by each validator. Material expert validation, is carried out in 2 stages with criticism and suggestions provided by the validator so that revisions are carried out so that at stage 2 the product is declared valid and Ideal for Utilization, whereas for media expert validation, validation is only carried out in 1 stage so that at this stage the product is being developed. has been declared valid and is Ideal for Utilization.

Discussion

This study aimed to analyze the need for innovative learning resources, particularly in the context of history education at the senior high school level. The preliminary needs analysis revealed that the existing learning environment still relies heavily on traditional teaching methods, such as lectures and textbook-based instruction. These approaches often fail to engage students or meet their learning preferences, particularly in the digital era. In response to these challenges, the researchers developed an interactive e-comic as a digital learning medium designed to enhance the teaching of historical material—in this case, the history of the Banten Kingdom.

The development of the e-comic was based on a structured process involving content design, layout planning, and expert validation. Feedback was collected from both material and media experts through questionnaires and qualitative suggestions. Material experts recommended revisions such as improving the numbering on image elements for better organization, clarifying the title to explicitly include the term "e-comic," and enhancing the structure of the bibliography and conclusion sections. Media experts supported the overall appropriateness of the e-comic but suggested aesthetic improvements, such as a more visually appealing cover and clearer articulation of learning objectives.

After integrating this expert feedback, the revised e-comic underwent further validation, resulting in a consensus that the media was highly suitable for classroom use. This assessment was supported by both qualitative suggestions and quantitative validation scores from experts and practitioners, reinforcing the idea that digital comics can serve as an effective instructional tool in history education (Fauzi & Kumalasari, 2020; Ma'unah et al., 2018; Sayono et al., 2020; Sukardi et al., 2021).

The theoretical foundation for this media development aligns with Mayer's Cognitive Theory of Multimedia Learning, which asserts that learning is more effective when information is presented through both visual and verbal channels (Mayer, 2009). This dual-channel approach allows learners to process content more deeply, particularly when both elements are meaningfully integrated. By combining visual illustrations with narrative text—and in this case, voice narration—the e-comic appeals to different learning preferences and supports deeper comprehension and retention.

The effectiveness of comics as learning media has been supported by prior research. For instance, Ofianto et al. (2022) demonstrated that the use of digital comics in history learning significantly improves student engagement and conceptual understanding. Similarly, Rahmawati et al. (2021) found that visual storytelling in educational comics helps learners grasp abstract historical concepts more easily. These findings validate the decision to incorporate interactive visual media in the current study and highlight the broader relevance of e-comics in history education.

The e-comic developed in this research covers a range of historical content, including biographies of key figures, the Banten Kingdom's role in the spread of Islam in Indonesia, its influence on trade, and its broader cultural and religious impact in the archipelago. These elements are presented through a narrative structure enhanced with illustrations, aiming to contextualize historical events in a way that

resonates with students. Clarke and Lee (2004) emphasize the importance of using culturally and historically relevant content to foster historical thinking and literacy, an approach reflected in the design of the comic.

One notable feature of the developed e-comic is its integration of a voice narration function, which supports auditory learners and increases accessibility. Students can activate this feature by selecting the "tap to voice" option, which plays an audio explanation of the content. Access to the e-comic is facilitated through QR codes or direct links, allowing for flexible use in both classroom and independent learning contexts.

While the developed media have been deemed appropriate for classroom use, this study acknowledges the need for further research. Future studies should focus on assessing the effectiveness of e-comics in improving specific learning outcomes, such as student achievement, motivation, historical understanding, and critical thinking skills. Additionally, the e-comic model can be adapted to cover other topics in the national history curriculum, including the Majapahit Kingdom, the Indonesian National Movement, or the Proclamation of Independence. Expanding the scope of application will help determine the consistency and generalizability of the e-comic's effectiveness across various historical contexts.

Moreover, the integration of additional interactive features, such as embedded quizzes, branching narratives, or gamified simulations, presents opportunities for future innovation. These elements can further enhance student engagement and provide formative assessment opportunities to reinforce learning.

4. CONCLUSION

Based on the research findings, it can be concluded that the absence of technology-based learning resources—particularly for history subjects—presents a significant gap in instructional practices, despite the availability of adequate infrastructure such as internet access. To address this issue, a digital learning resource in the form of an e-comic was developed to support the teaching of historical material, specifically the history of the Banten Kingdom. The final product, presented in both offline (application) and online (web link) formats, includes interactive features such as voice narration to enhance accessibility and engagement. Validation results from media and material experts indicated high feasibility, with scores of 91% and 80%, respectively, both falling into the "very good" category. The development of this e-comic represents an innovative step toward integrating digital media into history education, fostering greater student interest and comprehension. However, this study is limited to the design and validation stages and did not measure the impact of the e-comic on student learning outcomes or engagement in classroom settings. Therefore, future research is recommended to evaluate the effectiveness of e-comics through experimental or quasi-experimental methods, and to explore their application across other historical topics and educational levels to assess broader applicability and long-term impact.

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