

Development of Digital Comics Containing Legends as a Media for Intangible Cultural Heritage for Generation Alpha

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ABSTRACT

This research aims to develop a digital comic that raises the legend of 'Curug Awang' as an intangible cultural heritage medium for the Alpha generation. The alpha generation is the target user of research products because they are very visual tech-savvy, and familiar with smartphones and digital media. The research method applies the Multimedia Development Life Cycle (MDLC) model. The respondents consisted of two media experts, two linguists, 31 Alpha generations, and 27 teachers. Product testing showed that digital comics met the validation criteria, achieving an average score of 3.55 from media experts and 3.45 from linguists. At the user acceptance testing stage, Generation Alpha rated it at 83.46%, while teachers rated it at 84.6%. These results show that digital comic products are a valuable educational medium. Qualitative data revealed that these comics positively influenced the Alpha generation's understanding of the important values in the legend, namely perseverance and strong determination needed in the pursuit of knowledge, as well as the importance of environmental conservation. Teachers recognize the potential of digital comics to enrich the learning experience and convey meaningful moral messages to the younger generation. The results of this research not only succeeded in documenting and revitalizing the legend of Curug Awang but also contributed to the preservation of intangible culture, as well as overcoming the gap that has not been widely developed digital comics as a transformation medium to increase the awareness of the younger generation about local cultural heritage through interesting and easily accessible media.

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1. INTRODUCTION

The UNESCO Global Geopark paradigm emphasizes the importance of natural protected areas (NPA), which include intangible cultural heritage as a critical component (Esfehani & Albrecht, 2019). Since the Ciletuh-Palabuhanratu Geopark was designated as one of the UNESCO Global Geoparks (UGGp) in 2018, the challenge of preserving intangible cultural heritage has become increasingly

pronounced. The decline in knowledge surrounding local legends, such as that of 'Curug', poses significant risks not only to cultural preservation but also to educational practices. The loss of these legends diminishes community identity and hinders the transmission of local wisdom, which is vital for nurturing cultural diversity in educational contexts. Without effective strategies to revitalize this knowledge, educational frameworks may fail to incorporate essential cultural narratives, leading to a disconnect between younger generations and their heritage.

The waterfall, known as 'Curug' in West Java as one of the components of the NPA in Ciletuh-Palabuhanratu UGGp, contains a legend that has the potential to be a source of learning in education. The educational message of NPA-based geological conservation in education can be sourced from both intangible cultural values and natural values (Álvarez, 2020). The legend of 'Curug', associated with a waterfall in West Java, serves as a rich source of educational material. Waterfalls often embody legends that convey natural phenomena and historical narratives recognized by local communities (Miśkiewicz, 2016). However, interviews with residents and educators reveal a troubling trend: many no longer possess knowledge of the 'Curug' legend, which contributes to its absence in educational curricula. This disruption of cultural transmission is exacerbated by the loss of elder community members who traditionally passed down these stories. The importance of preserving such narratives is underscored by UNESCO's 2003 convention, which mandates the protection of intangible cultural heritage (Eichler, 2021). If these educational messages are not actively preserved, they risk becoming extinct, depriving future generations of valuable learning resources.

Targeting Generation Alpha as the demographic born from the early 2010s to mid-2020 offers a unique opportunity for intervention. This generation exhibits distinct developmental characteristics, including an affinity for digital media and storytelling. They are often characterized by their comfort with technology and preference for engaging, interactive learning experiences (Jaiswal, 2023; Novianti et al., 2019). Digital comics provide an innovative medium to introduce and reinforce the educational values embedded in the 'Curug' legend, making cultural learning accessible and relatable. Previous studies have indicated that digital comics effectively help young audiences connect with cultural values and traditions, while also shielding them from unsuitable foreign influences (Aggleton, 2019; Loudoun et al., 2024). Despite the promising potential of digital media in cultural education, a significant research gap remains. While numerous studies touch on the integration of folklore into educational frameworks, few specifically address the revitalization of local legends through digital formats for Generation Alpha. This study aims to fill that gap by exploring how digital comics can serve as a dynamic medium for cultural inheritance, thereby enhancing the educational landscape and fostering a deeper appreciation for local heritage among young learners. Through the development of digital comics based on the legend of 'Curug Awang', this research not only seeks to document and revitalize these narratives but also aims to contribute to broader cultural preservation efforts, ensuring that local wisdom is passed down through generations.

The existence of legends as oral literary works is increasingly worrying as the results of interviews with people who live closest to the location of Curug Awang. Several elementary school teachers who are closest to the Curug location in the Ciletuh-Palabuhanratu UGGp area also admitted that they no longer know the legend of Curug in the area where they live so they are not used as a source of learning in school. The unsustainable inheritance process is caused by the disruption of regeneration, including many speakers who have died. Another factor in the disruption of regeneration is caused by legends that have not been documented to be transformed into the younger generation. Legend is known as one of the intangible cultural heritages (Idris et al., 2016) and has been mandated at the 2003 UNESCO convention as one of the important cultural heritage that must be protected (Eichler, 2021). UNESCO's mandate is very reasonable so that the educational messages contained in the legend do not become extinct and can be used as teaching materials in the educational process.

The legend of 'Curug' contains the value of local wisdom that can be used as a source of national cultural learning (Nasaruddin et al., 2024). The legend of 'Curug' reflects the harmonious relationship between society and nature. The stories in these legends often emphasize the importance of preserving

the environment, respecting the heritage tradition of preserving the natural environment and strengthening the identity of the local community.

Developing digital comics by raising the educational values contained in the legend of 'Curug' through research is considered very important to reach the Alpha Generation interestingly and interactively. Digital comics not only convey moral and cultural messages but also relive legendary stories, making them easier for younger generations to understand and remember. With this approach, the local wisdom contained in the legend of 'Curug' can continue to be preserved and become a source of inspiration for the younger generation, especially for the Alpha generation who are in elementary school and early junior high school (Rusnali, 2021). According to the developmental characteristics of the young generation who are sitting at the elementary and early junior high school levels, they have the characteristics of liking stories and can be categorized as the alpha generation who are known to have access to information and digital communication technology from an early age. Digital comics offer a relevant and effective way to introduce valuable intangible cultural heritage to the younger generation. Several previous studies have proven that digital comics containing legends or folklore help the younger generation recognize cultural values and traditions, as well as protect them from inappropriate foreign influences (Aggleton, 2019; Hakim, 2017; Loudoun et al., 2024; Saputri et al., 2021; Setiawan et al., 2022; Wang et al., 2022). Thus, the development of digital comics containing the legend of 'Curug' sourced from the Ciletuh-Pelabuhan Ratu UGGp area is considered very important.

The results of the research on the development of digital comics aim to revitalize and instil character values in the younger generation through digital media. In addition, the current Alpha generation tends to prefer practical media to access information (Rina et al., 2020). Legend-charged digital comics are a suitable medium to facilitate the Alpha generation, which is known for its close connection to information and communication technology (Ziatdinov & Cilliers, 2021). Through the development of digital comics, the values of legends may not only be understood but also appreciated by the alpha generation. In today's digital era, children spend a lot of time with electronic devices, so digital comics loaded with the legend of 'Water Fall' can be an effective bridge to connect them with the local wisdom contained in the legend. With an engaging and interactive format, digital comics can capture their attention, making learning more fun and relevant to daily life.

In addition, this digital comic medium allows children to interact with the story directly, strengthening their understanding of the values contained in the legend of "Curug" or "Water Fall". Thus, digital comics not only function as an educational medium, but also as a means to foster love and pride in local culture among the younger generation (Azahary & Fatimah, 2024; Ferdian Noor, 2019). The urgency of developing digital comics with legends through this development research is an effort to document legends digitally and revitalize legends so that they can be transformed into the alpha generation. Therefore, this study aims to document and revitalize the legend of Curug Awang in the Ciletuh-Palabuhanratu UGGp area through Digital Comics. Through Digital Comics, it is hoped that it can become a medium of cultural inheritance loaded with local wisdom values to the alpha generation both in formal and non-formal paths. Through the digital comic containing the legend of 'Curug Awang', it is hoped that it can contribute to the conservation of geological diversity and the revitalization of intangible culture to make the sustainable development program a success (ElMassah & Mohieldin, 2020).

2. METHODS

The research method applied is the development of the Multimedia Development Life Cycle (MDLC) model. The purpose of the research is to produce digital comic products, MDLC was chosen with the consideration that it can produce various multimedia products including digital comics flexibly and can be adjusted to use. The MDLC applied in this study aims to develop digital comic media using 6 stages, namely concept, design, material collection, assembly, testing, and distribution. The MDLC design consists of six cycles, as shown in Figure 1.

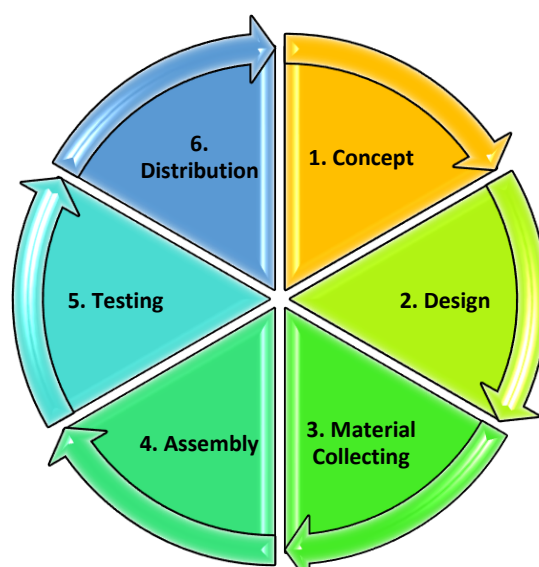


Figure 1. Method of

First, the concept stage is to define the objectives, identify the audience, the type of application (presentation, interactive, etc.), the purpose of the application (information, entertainment, training, education, etc.), and general specifications. In the concept stage, it is determined that the purpose and the users of the digital comics (identification audience), the type of application, the purpose of the application, and the general specifications are determined. The basis of design rules is also determined at this stage, such as the size of the application, targets, and others.

Second, design is to make detailed specifications about the object architecture, and the material requirements of the project, such as designing the navigation structure, designing the transition diagram, designing the display, storyboard, etc. This stage also affects the next stage in the manufacture of digital comic products. At this stage, the following activities are taken.

1. Actor Identification Before identifying a use case scenario, identifying the people interacting with the app or so-called actors is done first.
2. Identify use cases. A use case is the functional information of the system as seen from the user's point of view. Use cases describe the processes that exist in the system.
3. A use case diagram is a model for the behavior of the information system to be created. A use case describes the interaction between one or more actors with the information system to be created.
4. A scenario is a sequence of steps that describes between the user and the system. A scenario can contain all events on a specific object or class.
5. An Activity Diagram is a diagram that describes the workflow or activity of a system.
6. A storyboard is a description of each scene that describes the visual shape of the design, including the placement of multimedia elements. This storyboard will be used as a reference to carry out the process of creating a display at the implementation stage.

Third, the collection of materials. At this stage, a material collection such as image collection, photo taking, audio collection, and others is carried out for the next stage.

Fourth, Assembly is the stage where all multimedia objects are made. Creations are based on storyboards, flowcharts, and diagrams that come from the design stage.

Fifth, Testing The testing stage is carried out after the creation stage and all data has been entered. Product testing is carried out through the validation of media experts and user acceptance tests, namely teachers and elementary school students.

Sixth, Distribution is the stage where digital comic applications will be duplicated using build applications or other storage media.

2.1 Research Object

The object of research on the development of digital comics is the legend of Curug, especially Curug Awang, which is located in the Ciletuh-Palabuhanratu UNESCO Global Geopark (UGGp) area. The selection of this object is based on the consideration that the waterfall is one of the elements of geological diversity contained in its legends loaded with local wisdom to maintain the preservation of the waterfall. The meaning of the legend is beneficial for the Alpha generation because of the educational content about natural resource conservation.

2.2 Research Respondent

The respondents in this study included two media expert validators, two language validators, 31 alpha generations, and 27 teachers as respondents in testing digital comic products. To improve the accuracy of data from students and teachers, respondents came from students and teachers who lived in the Ciletuh-Palabuhanratu UGGp area and set criteria for selecting respondents. The criteria for student respondents are as follows.

1. Respondents aged 10 to 15 years include elementary school (SD) and early junior high school (SMP) students.
2. Respondents who showed interest in reading, especially in the genre of folklore, legend, or comic.
3. Respondents who have regular access to digital devices and the internet, both at home and at school.
4. Respondents who have learned learning materials related to local culture or legends before.

The criteria for teacher respondents are:

1. Respondents live in the Geopark Area and understand the importance of utilizing learning resources based on the potential of Geoparks.
2. Respondents are teachers who teach at the elementary school (SD) or early grades of junior high school (SMP) and have taught for at least one year.
3. Teachers who have basic skills in using digital devices (computers, tablets, or smartphones) and related applications to access and use digital comics.
4. Teachers who have used various digital learning media in their previous learning process.
5. Teachers willing to participate in research, including providing feedback on the effectiveness of digital comics as a learning medium.

The snowball sampling method was used to select interview respondents. They are high-grade elementary school students and early junior high school (SMP) classes, as well as teachers who live in the Ciletuh-Palabuhanratu UGGp area. The snowball technique is used by first establishing contact with one or two initial respondents from the sampling framework. Furthermore, the initial respondents were asked to provide information on other respondents who they thought had accessed a digital comic containing the legend of Curug Awang.

While the snowball sampling technique was employed to select respondents, we acknowledge potential limitations, such as selection bias and the risk of homogeneity among participants. To mitigate these limitations, we ensured diversity in the initial contacts by selecting respondents from various educational backgrounds and experiences. Additionally, we actively sought referrals from different community members to broaden the respondent pool.

2.3 Research Instruments

The research instruments developed consist of two types, namely questionnaires and interview guidelines. The questionnaire was used to obtain data on the results of the validation of comic products by validators of media experts, linguists, and user acceptance, namely the alpha generation and teachers. This instrument was developed to be applied at the testing stage of the MDLC research method stage.

To ensure reliability and appropriateness, the questionnaires were pre-tested with a small group of respondents outside the target population. Feedback was collected to refine the questions for clarity

and relevance. The final version utilized a Likert scale (1 to 4) to categorize responses as excellent, good, sufficient, or less. Additionally, the instruments were validated by media experts and linguists to confirm that the questions effectively measure the intended constructs.

The interview guideline instrument is used to collect qualitative data, namely information about legends and digital comics from the alpha generation and teachers. The interview guidelines were compiled to make it easier for researchers to explore information about the legend of Curug Awang and digital comics that have been accessed by the alpha generation and teachers. More specifically, data is needed to identify the legend of Curug Awang, known by alpha generation respondents before accessing digital comics, as well as the benefits obtained from digital comics. The information excavated from teacher respondents is needed to obtain information about the legend of Curug Awang that teachers know before accessing digital comics, media that have been developed and used by teachers in learning, and teachers' readiness to use digital comics in teaching legends. The interview guidelines were also subjected to expert review to assess their appropriateness and clarity. Adjustments were made based on expert feedback to ensure the questions would elicit comprehensive qualitative data regarding the legends and the digital comics.

2.3.1 Media Expert Validation Instrument

The validation of digital comic products by media experts is intended to validate digital comic products from the graphic aspects, presentation aspects, and application aspects (Table 1).

Table 1. Media Expert Validation Instrument

No	Validation aspects	Validation Criteria	Validation Score			
1.	Graphic Aspects	Image and illustration size accuracy	4	3	2	1
		Accuracy of the shape of images and illustrations				
		Balance of proportions of images, illustrations and text				
		Accuracy of the layout of the story sequence				
		Neat layout of the story sequence				
		Total of graphic aspect scores				
2.	Aspects of presentation(display)	Storyline clarity				
		Accuracy in character selection				
		Matching images to stories				
		Accuracy of conversation balloon placement				
		Image quality (color and <i>background</i>)				
		Design display of each screen				
		Opening design display (opening)				
		Matching the color of the writing to the <i>background</i>				
Total of presentation aspect scores						
3.	Application Aspects	Simple operation				
		The file size is not large				
		Digital comic media is easy to install				
		Appropriate time in the medium				
		Ease of use of navigation buttons				
Total application aspect score						
Average Score						

2.3.2 Linguist Validation Instrument

The linguist validation instrument was developed to validate digital comic products from the aspect of the language used in the comic dialogue. The criteria for language aspects include language suitability with the language ability of the Alpha generation, ease of understanding, language meaning, language relationship with the meaning of dialogue, language compatibility with characters, language compatibility with the meaning of messages, and term writing. Linguist validation instrument (Table 2).

Table 2. Linguist Validation Instrument

No	Validation aspects	Validation Criteria	Validation Score			
			4	3	2	1
1.	Language Aspects	Compatibility of the language used with the language skills of the Alpha generation				
		The language is easy to understand				
		Language has no double meaning				
		The Connection of Language to the Meaning of Dialogue/Conversation				
		Conversational language compatibility with comic characters				
		Compatibility of Language with the meaning of the message in the comic story				
		Accuracy of term writing				
		Total Language Aspect Score				
		Average score				

2.3.3 Alpha Generation Acceptance Instrument for Digital Comics

The acceptance instrument was developed to test digital comic products from the aspect of acceptance by the alpha generation. The dissemination of instruments uses Google Forms or in Indonesian called Google Forms is a useful application to help collect information in a short, easy, and efficient manner. Google Forms can also be used to collect data assisted by questionnaire instruments. By using Google Forms, filling out questionnaire forms becomes faster, easier, and accessible to anyone without having a face.

Table 3. Testing Instruments for Alpha Generation Acceptance of Digital Comics

No	Aspects of Acceptability	Acceptance Indicators	Alpha generations Score			
			4	3	2	1
A.	Benefits of digital comics	1. The Digital Comic about the Legend of Curug Awang is useful to help me learn about the legend.				
		2. The Digital Comic about the Legend of Curug Awang helped me learn moral messages that I could apply.				
		3. Digital comics about the Legend of Curug Awang are useful in increasing my interest in reading.				
B.	Student interest in digital comics	4. I'm interested in digital comics				
		5. I'm happy with comic stories				
		6. Comics are easy to understand the story				
C.	Digital comics display	7. Digital comics increase my interest in reading				
		8. Comic general appearance				
		9. Comic background				

No	Aspects of Acceptability	Acceptance Indicators	Alpha generations Score			
			4	3	2	1
		10. Readability of text/sentences in comics				
		11. Characters in comics				
		12. The size of the text bubble on the comic				
Total Score						
% Score						

2.3.4 Testing Instrument of Teachers' Acceptance of Digital Comics

The teacher's acceptance instrument for comics was developed with the aim of testing comic products from the aspect of digital comic acceptance by teachers. Deploying instruments also uses Google Forms in a practical, easy, and efficient way.

Table 4. Instrument of Teachers' Acceptance of Digital Comics

No	Aspects of Acceptability	Acceptance Indicators	Teachers' Score			
			4	3	2	1
A.	Utility of Digital Comics	1. The benefits of digital comics for teachers.				
		2. The benefits of digital comics for elementary school students.				
		3. Digital comics are useful for conveying the educational message of local wisdom to preserve the waterfall.				
		4. Digital comics are useful for conveying the message of local wisdom of the legend of Curug Awang.				
		5. The display of digital comics is able to attract the attention of the alpha generation.				
		6. The language in digital comics is easy to understand for the alpha generation				
		7. The storyline of digital comics is easy to understand for the alpha generation				
		8. The operation of digital comics is easy for the alpha generation to use.				
B.	Accuracy of digital comics	9. Digital comics are effective as a medium for transforming messages of local wisdom sourced from legends.				
		10. The storyline of digital comics corresponds to the meaning of the story.				
		11. Colour integration of text letters with matching backgrounds and balloons.				
		12. Illustrations of story characters and the meaning of the story are appropriate.				
		13. The placement of illustrations, characters, backgrounds, and word balloons is proportional.				
		14. The background is displayed according to the message of the story.				
		15. Characters picture of the story according to the role of the character.				
C	Digital Comic Display	1. Comic general appearance				
		2. Picture of a story character illustrating a character				
		3. Educational messages contain the value of local wisdom				
		4. The phrase of the story character contains exemplary behaviour				
		5. Communicative comic language				
Total Score						

Average score

2.3.5 Alpha Generation Interview Instruments

Table 5. Alpha Generation Interview Guidelines

No	Questions
1.	Before there was a digital comic containing the legend of Curug Awang, have you ever known or read the story of the legend of Curug Awang? If so, who did you get the information from? Is the information obtained a complete and thorough story?
2.	Is the existence of this digital comic containing the legend of Curug Awang useful for you?
3.	What lessons can be learned from reading digital comics containing the legend of Curug Awang?

2.3.6 Teacher Interview Instrument

Table 6. Teachers' Interview Guidelines

No	Questions
1.	Have you ever known or received information about the legend of Curug Awang before this digital comic?
2.	Have you ever taught students the legend of Curug Awang, which is known as the potential advantage of Geopark?
3.	Have you ever developed or used comic media in teaching at school?
4.	Is the existence of this digital comic containing the legend of Curug Awang useful for you to use as a learning medium?

2.4 Data Analysis Techniques

The research data collected consists of two types, namely quantitative data and qualitative data. Quantitative data was obtained through testing of digital comic products by media experts and linguists, as well as from product acceptance assessments by the Alpha generation and teachers. Meanwhile, qualitative data was collected through interviews with the Alpha generation and teachers, which aimed to explore their understanding of the legends before the advent of digital comics, as well as their opinions on the benefits offered by digital comics.

2.4.1 Techniques for analyzing comic product data testing by media experts and linguists

The data analysis technique used to analyze the results of expert validation is the calculation of the average score of various aspects of comic products assessed using the Likert scale. This scale serves to measure the extent to which digital comic products meet predetermined criteria. Validation instruments are compiled and assigned to media experts and linguists to evaluate the quality of the comics and to identify areas that need improvement. The validation score is calculated by adding up the average of all aspects and dividing them by the number of aspect items, using the formula (Figure 2)

$$\bar{X} = \frac{\sum x}{n}$$

Figure 2. Formula of Data Analysis Techniques for Expert Validation

- \bar{X} = Score average
- $\sum x$ = Total Score
- N = Number of statement items

The average score of the expert validation analysis results was obtained using the formula (figure 2) compared to the following criteria.

Score Average	Validation Criteria
≥ 4.0	Excellent
≥ 3.0 – 3.9	Good
≥ 2.0 – 2.9	Enough
≤ 1.0 – 1.9	Less

2.4.2 Data Analysis Techniques for Testing the Acceptance of Generation Alpha and Teachers

Data from testing user acceptance as research respondents were collected through questionnaires processed using the percentage of eligibility formula. This percentage indicates the level of feasibility and suitability of digital comics with the set criteria. The data analysis technique will be processed with the following formula.

$$P \% = \frac{\sum x}{\sum xi} \times 100\%$$

Figure 3. Formula of Data Analysis Techniques for User Acceptance

P % = Value the benefits and accuracy of digital comics

$\sum x$ = The total number of respondents' answers per 1 question

$\sum xi$ = The ideal number of scores for each question

The results of the average acceptance value obtained through analysis using a formula (figure 3) compared to the table of digital comic eligibility categories.

Very worthy	81 – 100%
Worthy	81 – 100%
Quite decent	61 – 80%
Less worthy	21 – 40%
Not eligible	≤ 20%

Qualitative data analysis techniques are sourced from interviews applied to Huberman's theory, namely data reduction, data display, and conclusion drawing/verification.

3. FINDINGS AND DISCUSSION

The results of research on the development of digital comics using the Multimedia Development Life Cycle (MDLC) model succeeded in revitalizing the legend of Curug Awang. The development process involves six systematic stages, which are designed to produce a quality digital comic final product.

3.1 Concept Stage

At this stage, the story ideas and characters were successfully formulated, targeting the Alpha generation as the main audience. The emphasis on local wisdom values in the characters developed

gives depth to the story. The character of Princess Nawang Wulan is a royal princess who has a concern for the importance of protecting the natural environment, creating a relevant moral message for the alpha generation. This shows that the character of a legendary figure can be played as an example of character education (Nasaruddin et al., 2024).

3.1.1 Design Stage

Creating a synopsis, storyboard, and visual design plays a crucial role in compiling an interesting storyline. Interaction with the planned target audience also provides a more immersive experience, allowing the reader to emotionally engage with the story (Swandi et al., 2020).

3.1.2 Material Collecting Stage

Gathering references from legal and reliable sources of documents available at the Tourism, Culture, and Youth Development Office can help ensure the accuracy and credibility of the content. It also supports the preservation of local culture by utilizing existing resources.

3.1.3 Assembling Stage

The assembling stage is a production process that involves the development of panel images and the writing of dialogues to ensure that the comic meets the set quality standards. The editing is done also contributes to the smooth flow of the storyline.

3.1.4 Testing Stage

Validation by media experts and linguists shows that digital comic products have met the eligibility criteria. Good validation results show that the research team has successfully identified and improved aspects that need to be improved, such as the inclusion of the agency's logo and usage guidelines.

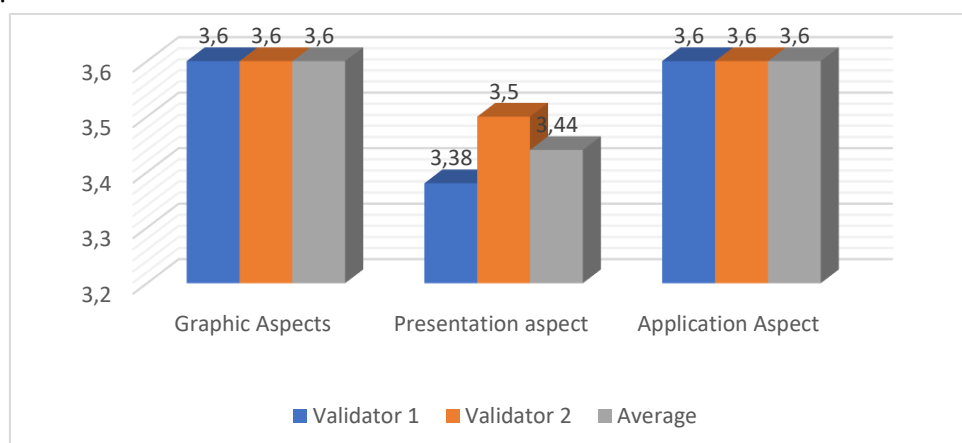


Figure 3. Acquisition of Media Expert Validation Score

From the average of the three aspects of the validation criteria, graphics, displays, and applications, an average of 3.55 was found when counted and taken. Based on the average validation score obtained by media experts, it shows that the three aspects of digital comic media obtained an average score of 3.55 from validator 1 and validator 2. Thus, the results of the validation of media experts reached the good category.

The scores provided by both validators are closely aligned, particularly in graphic and application aspects, which demonstrates reliability in the evaluation process. This consistency reinforces the validity of the findings. The suggestion from Validator 1 is to include a logo representing the research team's affiliation indicating a proactive approach to enhancing the product's credibility and branding. This feedback can help refine the final version of the digital comic.



Figure 4. The End of Story Curug Puncak Manik and Curug Awang

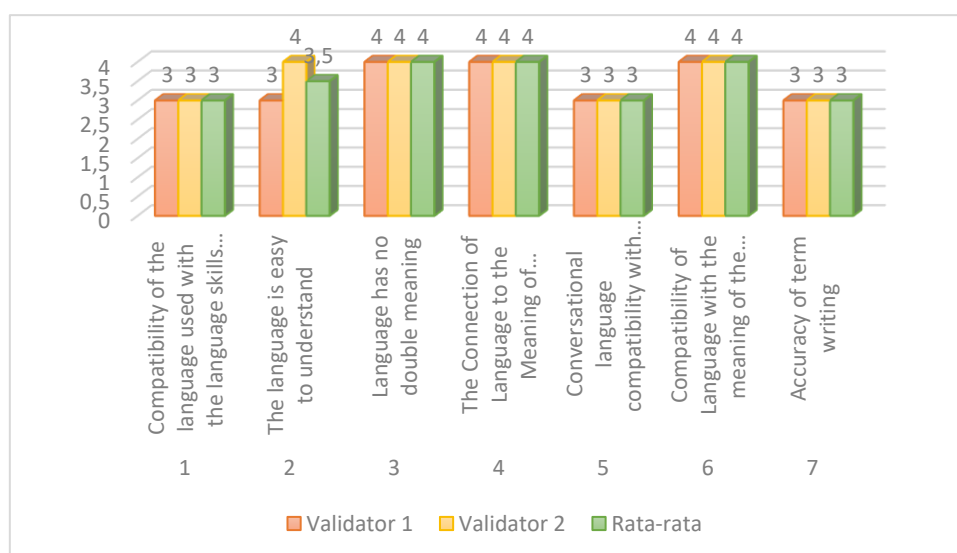


Figure 5. Acquisition of Linguist Validation Score

Based on the average validation score of linguists, it shows that the aspect of language use in digital comics obtained an average score of 3.4 for validator 1 and 3.5 for validator 2, from two

validators averaging 3.45. The average score met the good criteria. Thus, the use of language in digital comics is well-validated or a good category.

The acceptance test of comic products to the alpha generation shows that comic products can be accepted by the generation in terms of benefits, comic appearance and generational interest in reading digital comics.

Table 9. Percentage of Acceptance Score Generation Alpha towards Digital Comics

No	Acceptability aspect	(%) Score
1	Benefits of digital comics	87.9
2	Students' interest in digital comics	79.4
3	Digital comics display	83.1
Average of acceptance		83.46

The results of data analysis obtained from the questionnaire show that the Alpha generation accepts the developed digital comics well. With the percentage of benefits reaching 87.9%, student interest at 79.4%, and comic display at 83.1%, obtaining an average of 83.46, it can be concluded that this comic is very worthy and has managed to attract students' attention. The high level of benefits shows that comics are not only entertaining but also educational, providing added value to the learning process.

The results of the study show that the alpha generation is very worthy of acceptance of digital comics that contain legends. This finding is in line with the opinion of Rina et al. who stated that digital comics can be an effective medium for improving the quality of learning (Afriliani et al., 2022; Rina et al., 2020; Sukmanasa et al., 2017). Digital comics can help build positive educational values among elementary school students and early middle school students, who are part of the alpha generation. With their proximity to technology, the alpha generation is more easily connected to visual media (Rachman et al., 2023). Therefore, the use of digital comics as a means of education has the potential to increase their interest and understanding of local wisdom.

The teacher's acceptance test for digital comics was analyzed positively, and the results of the data analysis are as follows.

Table 10. Percentage of Acceptance Score Teachers on Digital Comics

No	Acceptability aspect	(%) Score
1.	Utility of digital comics	87.5
2.	Accuracy of digital comics	83.0
3.	Digital comics display	83.5
Average of acceptance		84.6

The results of the data analysis obtained from the questionnaire showed that teachers received digital comic products well. With the percentage of accuracy of the comic reaching 87.5%, the benefits of the comic at 83.0%, and the appearance of the comic at 83.5%, obtaining an average of 84.6, it can be concluded that this comic can be accepted by teachers. Thus, teachers recognize digital comic products as a learning medium.

The validation scores for the digital comics developed in this study indicate a generally positive reception, with an average score of 3.53 from media experts and 3.45 from linguists. However, a more detailed breakdown of specific strengths and weaknesses identified by the validators would enhance our understanding of the validation process. For instance, while graphic and application aspects received high scores, the presentation aspect could benefit from further refinement, as indicated by its

lower average score of 3.4. Highlighting these specific points would provide clearer guidance for future iterations of the comic.

Incorporating direct quotes from interviews with students and teachers would add depth to the discussion of the themes identified in the research. For example, sharing students' reflections on how the comic influenced their understanding of local legends or how teachers perceive the educational value of digital comics could provide valuable qualitative context. This firsthand feedback could illuminate the impact of the comics beyond numerical scores, illustrating their potential to engage and educate.

To situate this research within a broader context, it would be beneficial to compare these findings with similar studies on digital comics and cultural education. For instance, previous research has shown that digital comics can enhance learning experiences and cultural understanding among younger audiences (Afriliani et al., 2022). Discussing how this study's results align or contrast with those findings could strengthen the argument for the effectiveness of digital comics in educational settings and highlight unique contributions or challenges observed in this research.

Finally, addressing the potential for applying the Multimedia Development Life Cycle (MDLC) model to other legends or cultural contexts beyond Curug Awang would broaden the implications of this study. This research demonstrates that digital comics can effectively revitalize cultural narratives and engage the Alpha generation. Future research could explore how this model can be adapted to other cultural stories, potentially enriching the educational landscape and preserving diverse cultural heritages across different regions.

3.2. Figures, Tables and Schemes

After testing, digital comics are distributed through the Webtoon platform to guarantee wide accessibility for the Alpha generation. This is important to ensure that the comic is easily accessible to the targeted audience through https://www.webtoons.com/id/canvas/legenda-curug-awang/list?title_no=987660. How to access digital comics is described as follows.

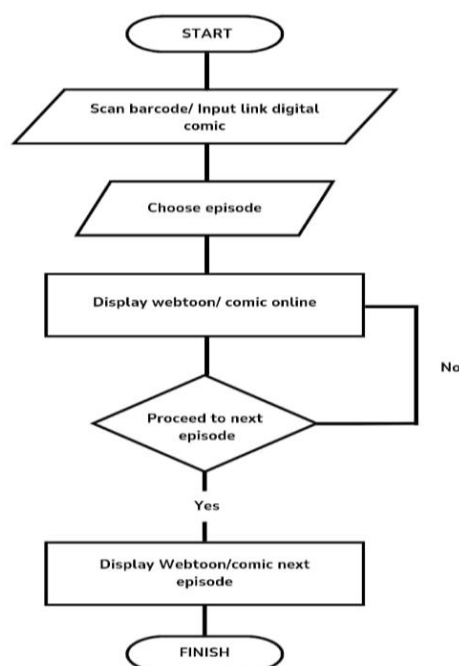


Figure 6. Ways to Access Digital Comics

3.2.1 Alpha Generation Interview Results

Of the 15 respondents, all students admitted that they had heard of the Awang Waterfall, but none had ever read the full story. The information they have comes from parents who mention that Curug Awang has fairy tales. However, they do not know the details of the story. This suggests that despite the awareness of the existence of legends, their understanding remains superficial, which could be due to a lack of access to more complete sources of information in the context of education.

Respondents of the alpha generation uniformly stated that digital comics containing the legend of Curug Awang were very useful. They enjoyed reading the story and found it interesting. Respondents stated that digital comics not only provide entertainment but also help them understand the values contained in legends. This shows that digital media can be an effective tool to introduce and bring local culture closer to the younger generation.

From the students' answers about the lessons learned from digital comics, there are several important points, namely:

1. Six male students emphasized the importance of perseverance in learning, inspired by the character of Prince Cunduk Kayu. This shows that the characters in the story serve as positive role models for students.
2. Three other male students highlighted the importance of having a strong determination to learn, especially in the context of Kanuragan science. This indicates that the theme of courage in the story motivates students to face challenges.
3. Six female students revealed that the message from Princess Nawang Wulan about the importance of preserving nature was very impressive to them. This shows that digital comics not only teach educational values but also instill a sense of responsibility for the environment.

The results of the alpha generation interviews show that digital comics containing the legend of Curug Awang have a positive effect on students' understanding of folklore (Banggor et al., 2024; Rina et al., 2020). In addition to introducing them to cultural heritage, the comic also teaches important values such as perseverance, determination, and environmental conservation. This research emphasizes the need for the integration of digital media in education to attract interest and enrich the Alpha generation's knowledge of local culture (Ding, 2022; Nasaruddin et al., 2024).

The results of the interview that show the benefits of digital comics are identified from the following statements.

Question: "Before there was a digital comic containing the legend of Curug Awang, have you ever known or read the story of the legend of Curug Awang? If so, who did you get the information from? Is the information obtained a complete and thorough story?"

Response Excerpt: "I had heard about the story about CurugAwang from my parents, but I didn't get the full story. It turns out that after accessing digital comics it is interesting and some lessons can be taken."

The response excerpt indicates that the speaker had prior knowledge of the Curug Awang story, primarily from their parents, but lacked comprehensive details. After engaging with digital comics that present the story, the speaker found the content captivating and recognized that it imparted valuable lessons. This suggests that digital comics serve as an effective medium for deepening understanding and interest in cultural narratives.

3.2.2 Teacher Interview Results

The results of the teacher interviews revealed several key themes regarding their knowledge and use of the legend of Curug Awang. All ten respondents acknowledged familiarity with the legend; however, their understanding was superficial, primarily based on information passed down from parents in the village, indicating a basic awareness but a lack of in-depth knowledge that could hinder effective teaching. Six of the teachers reported discussing the Curug Awang with students, albeit only in a limited capacity, while four admitted they had never mentioned it at all. This illustrates that,

despite recognizing the potential value of legends in education, their practical application remains minimal. Furthermore, when questioned about the use of comic media in teaching, all teachers indicated they had never developed or utilized comics, including digital formats. This highlights a gap in innovative teaching aids within the educational process, which may impact how materials are presented to students. However, all respondents expressed that digital comics featuring the legend of Curug Awang would be beneficial as a learning medium. They felt encouraged by the content and were open to incorporating it into their teaching, recognizing its potential to inspire students, particularly in terms of character education. Thus, digital comics are seen as a valuable tool for enriching students' learning experiences and conveying important moral lessons.

This finding is supported by the statements of respondents when given questions.

Question: *"Is the existence of this digital comic containing the legend of Curug Awang useful for you to use as a learning medium?"*

Response Excerpt: *"I mention the Curug Awang sometimes, but I don't go into details. My students know it exists, but I feel I lack the resources to teach it properly. With this digital comic, teachers are very helpful in teaching legends to students and it turns out that legends that are in danger of being lost can be revived by digitization. We are ready to use this digital comic as a medium for learning local wisdom sourced from legends in schools."*

That statement conveys that the speaker occasionally references the Awang Waterfall in discussions but does not provide comprehensive information about it. While the students are aware of the waterfall's existence, the speaker feels inadequate in their ability to teach the topic effectively due to a lack of resources. This highlights a gap in both the depth of knowledge shared with students and the necessary materials or tools to facilitate a thorough educational experience.

4. CONCLUSION

The Multimedia Development Life Cycle (MDLC) method applied in this study successfully produced digital comic products that meet the validation criteria set by media experts and linguists. Product testing revealed strong acceptance from both the Alpha generation and teachers, with high average scores in graphics, language, and application aspects. The findings indicate that understanding of the Curug legend, as part of intangible cultural heritage, has diminished among the younger generation, primarily due to insufficient documentation and sustainable inheritance practices, which jeopardize the continuity of local wisdom.

The development of digital comics emphasizing the educational value of the Curug legend has proven effective in engaging the Alpha generation. Their interactive and appealing format makes digital comics an appropriate medium for introducing and preserving cultural heritage. Beyond serving as an educational tool, these comics foster love and pride in local culture, contributing to the conservation of geological diversity and the revitalization of intangible traditions. Respondents, including Generation Alpha and teachers, expressed positive feedback regarding the benefits and ease of using digital comics, with both quantitative and qualitative data analyses indicating that the majority found them useful for learning and understanding the values of legends.

However, this study has limitations, including a small sample size and a focus on a single legend, which may affect the generalizability of the findings. Future research should explore how digital comics can be integrated into formal curricula and adapted for other cultural traditions. Additionally, longitudinal studies are recommended to observe changes in understanding and interest in cultural heritage over time. By addressing these areas, future research can further enhance the role of innovative media in cultural education.

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