Design of Augmented Reality Interactive Learning Media in Learning Sundanese Fairy Tales

Shoofii Nurrizki Dzakiah¹, Haris Santosa Nugraha²*, Dede Kosasih³, Temmy Widyastuti⁴

Abstract: Fairy tales contain noble values that can shape students' characters. Specifically, students' ability to understand Sundanese fairy tales currently tends to be low due to the increasing rarity of Sundanese being used in everyday life. For this reason, it is necessary to involve technology-based media that is interesting and able to increase motivation to learn fairy tales. The purpose of this research is to describe the needs analysis, design, and testing of augmented reality learning media development in Sundanese fairy tale material. The method used in this research was the R&D research method with the ADDIE model. The participants involved in this study included two experts (media and literature learning), six Sundanese language teachers, and 24 elementary school students. The research instruments employed were questionnaires, interviews, and tests. The resulting data were then processed using quantitative descriptive techniques, which were then interpreted qualitatively. The results revealed three things: 1) there was a need for the development of fairy tale learning media using augmented reality media; 2) augmented reality media was designed through three stages, namely formulating media concepts (selection of fairy tales and analysis of fairy tale characteristics), designing storyboards (visualization of plot, setting, and characters), and preparing and determining design components using the assemblr EDU application; and 3), the results of expert validity of the augmented reality media design developed could be categorized as very good, with an average percentage of feasibility reaching 92.4%. The implications of using augmented reality media can color the use of digital media in Sundanese language learning as an alternative solution to improving students' ability to understand Sundanese fairy tales.

Keywords: Media design; augmented reality; Sundanese fairy tales; assemblr EDU
penggunaan media augmented reality ini dapat mewarnai penggunaan media digital dalam pembelajaran bahasa Sunda sebagai salah satu alternatif solusi dalam meningkatkan kemampuan siswa memahami dongeng bahasa Sunda.

Kata Kunci: desain media, augmented reality, dongeng bahasa Sunda; assemblr EDU

Submitted: December 2023  Accepted: February 2023  Published: March 2023

INTRODUCTION

Learning media in the teaching and learning process can essentially convey learning concepts according to the characteristics of the material so that it is easy to understand. Learning media can be one way to improve the quality of education (Fitri, 2021; Pangestu & Rahmi, 2022). The quality of education is needed to achieve educational goals that affect the quality and quality of human resources (Riowati & Yoenanto, 2022; Safitri et al., 2022). Through learning media, students can get a real experience in the learning process. Besides that, learning will be more interesting and not boring (Layaliya et al., 2021). However, the use of learning media in the field has not been optimized, and some are still using traditional media, leading to students being less interested and motivated (Ahmad, 2023; Winangsih & Harahap, 2023). Therefore, the use of learning media must vary to make it more interesting and can add to the learning experience and improve the quality of education.

The variety of learning media needed can be created by utilizing technological assistance in the field of education. Educators must be able to improve digital literacy and skills to fulfill their role as learning facilitators (Sianipar et al., 2023; Siregar et al., 2023; Sugianto & Farid, 2023). Technology applied in learning media can significantly change the world of education to be more practical, interesting, and efficient (Miasari et al., 2022; Subroto et al., 2023; Suharmawan, 2023). The use of technology in education is also not limited to the field of learning. All fields of learning can utilize technology to support teaching and learning activities, including the field of language and literature learning.

In the field of language and literature, not only the national language must be learned, but there are also regional languages included in the local content of the curriculum that must be preserved. The Ministry of Education and Culture (2020) said that "the extinction of regional languages in Indonesia is starting to be threatened and must be followed up," based on data in the Regional Language Vitality Condition Overview in Indonesia. Likewise, Sundanese is inseparable from the phenomenon of extinction of regional languages in Indonesia if it is not preserved. Based on research by Aljamaliah and Darmadi (2021) regarding the use of Sundanese, 73.6% of 250 children still use Sundanese as their mother tongue, but their mastery ability is categorized as low. Therefore, it is crucial to revitalize regional languages that are packaged more contemporary and follow the times (Terupun & Lampoliu, 2023; Yulia et al., 2023).

The language revitalization movement, by utilizing technology, can be started by learning in schools. One of the materials in Sundanese language learning is fairy tales, which are usually interesting for students because they contain folklore and noble values that can shape student character (Annisya & Baadilla, 2022). However, when learning fairy tales takes place, teachers tend to tell stories by not using media that is attractive to students (Ahmad, 2023). The average student's ability to listen to fairy tales using traditional media is shown to be 67.2, while when audiovisual media is involved, the average student's ability to listen to fairy tales increases to 84.53 (Nurani et al., 2018). Hence, it can be concluded that students' ability to understand Sundanese fairy tales with traditional media tends to be low. This can also be influenced by the use and ability of Sundanese in everyday life. Therefore, to make learning fairy tales more interesting for students, it is necessary to involve
interesting learning media, such as audiovisual forms, so that learning is not monotonous and motivates students (Rosyidah et al., 2023; Setiyaningsih et al., 2023). The media can be made by utilizing technology.

One of the developments in digital technology that can be used to improve the quality of learning is augmented reality (Pangestu & Rahmi, 2022). Augmented reality can be used as a variety of interactive learning media as an innovation in the field of education. The selection of learning media to convey material must be appropriate to attract students' learning motivation and make students more active in learning (Putri & Guspatni, 2023; Wulandari et al., 2023). By using augmented reality, students can get real learning experiences. In learning in this digital era, students must also have competencies that are considered important, namely 4C competencies (critical thinking, creative thinking, collaboration, and communication). Meanwhile, the utilization of augmented reality not only improves learners' understanding of various subjects but also motivates them to engage more actively in learning (Kuswinardi et al., 2023). Augmented reality can also help students improve their 4C competencies through motivation and activeness in learning. Therefore, based on some of these advantages, augmented reality can be utilized as a language learning medium, including Sundanese, especially in the material of fairy tales. Fairy tales can be transformed into augmented reality, which is audiovisual as a medium for learning Sundanese fairy tales.

Before using augmented reality as a learning media, it is necessary to design in advance according to the material and learning objectives to be achieved. Learning media design must go through the media development stage so that it can be used. Research on the development of augmented reality learning media design is not new. Previously, several studies on the design of augmented reality learning media development have been conducted. In the research of Setiawan et al. (2023), augmented reality was developed for English learning media at the elementary school level. Furthermore, in the research of Titiiana et al. (2022), augmented reality was developed in the form of English storybooks for early childhood. In Kamaruddin et al.'s research (2019), augmented reality was developed to improve students' Arabic language acquisition skills. In the research of Pamungkas et al. (2022), the Indonesian-language Reog Ponorogo folklore was developed in augmented reality. Moreover, in the research of Mambu and Chirst (2021), the folklore of North Sulawesi was developed in the form of augmented reality.

Based on previous research, augmented reality has begun to be developed in the field of language and literature. Augmented reality has been developed for learning in language Indonesian, English, and other foreign languages, as well as in Sundanese language learning. In the research of Zikra et al. (2021), AR was developed for basic Sundanese language learning by introducing the names of fruits and vegetables. Furthermore, in the research of Hidayat et al. (2022), AR was designed to learn media for Sundanese script at the junior high school level. A study (Hakim, 2021) also used augmented reality to introduce Sundanese traditional ceremonies through applications.

In light of several of these investigations, augmented reality is not a new thing that is used in Sundanese language learning, but augmented reality has not been developed in Sundanese language fairy tales, which can also be used for learning media. Also, based on the results of field observations and interviews with six Sundanese language teachers and 24 elementary school students, learning media began to use technology, but it has not yet been in the form of attractive audiovisual media. This aligns with the finding that the media used by teachers in learning fairy tales is not interesting for students (Ahmad, 2023). Therefore, this research needs to be done to develop interactive learning media for Sundanese fairy tales in the form of augmented reality in accordance with Sundanese learning materials so that it can be used as a learning medium. The novelty in this research lies in the
augmented reality developed for learning media for Sundanese fairy tales. Augmented reality was
designed in such a way that students can visualize the contents of fairy tales and increase their
understanding of the contents so that learning objectives can be achieved. Therefore, this study aims to
describe the needs analysis, design, and testing of augmented reality learning media development in
Sundanese fairy tale material.

RESEARCH METHODS

The method used in this research was the R&D research method. This kind of research is
conducted to produce a product design, which is then internally validated (Sugiyono, 2016). The
development research model chosen was the ADDIE development model (analysis, design,
development, implementation, evaluation) (Winarayati, 2021). In accordance with its extension in the
ADDIE development model, five stages guide development research: the analysis, design,
development, implementation, and evaluation phases (Rayanto & Sugianti, 2020). Due to the limited
time and ability of researchers, the stages of the model used only included three stages, namely
analysis, design, and development.

In this study, several participants were involved as sources of research data. At the analysis
stage, interviews were conducted with data sources from six elementary school Sundanese language
subject teachers and 24 students. The samples were selected based on the categories of excellent,
good, and good enough school accreditation. The next data sources were two media experts, two
literature learning material experts, and 24 elementary school students, who were the sources at the
internal validation stage.

The data collection techniques employed questionnaires, interviews, and observations. The
research instruments used in this study were questionnaires, interview guides, and tests. Questionnaires were used to determine the feasibility level of augmented reality media for Sundanese
fairy tales from experts and the practicality of media from students. Furthermore, interviews were used
in the early stages, namely field analysis related to the use of learning media. The instrument chosen
for expert validation, media practicality, and user response was a questionnaire. The validation
instrument was arranged in such a way with the following grid:

<table>
<thead>
<tr>
<th>No.</th>
<th>Aspects</th>
<th>Indicator</th>
<th>Question Item Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>View</td>
<td>Accuracy of learning media layout elements</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The accuracy of color selection in the developed multimedia</td>
<td>2</td>
</tr>
<tr>
<td>2.</td>
<td>Image</td>
<td>Accuracy of image selection</td>
<td>3 &amp; 4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Image selection quality</td>
<td>5 &amp; 6</td>
</tr>
<tr>
<td>3.</td>
<td>Packaging</td>
<td>Appropriateness of appearance with content</td>
<td>7, 8, &amp; 9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Media quality</td>
<td>10 &amp; 11</td>
</tr>
</tbody>
</table>

Modified from Nurhasan (2021) and Pribowo (2018)

Table 2. Material validity grid

<table>
<thead>
<tr>
<th>No.</th>
<th>Aspects</th>
<th>Indicator</th>
<th>Question Item Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Curriculum</td>
<td>Suitability of KI/KD (Core Competencies/Basic Competencies)</td>
<td>1 &amp; 2</td>
</tr>
<tr>
<td>No.</td>
<td>Aspects</td>
<td>Indicator</td>
<td>Question Item Number</td>
</tr>
<tr>
<td>-----</td>
<td>-------------------------------</td>
<td>-----------------------------------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>1.</td>
<td>Content and purpose</td>
<td>Completeness and purpose</td>
<td>1 &amp; 2</td>
</tr>
<tr>
<td>2.</td>
<td>Learning</td>
<td>Provide learning opportunities, interest, and attention</td>
<td>3</td>
</tr>
<tr>
<td>3.</td>
<td>Aesthetics</td>
<td>Display quality and concept suitability</td>
<td>4 &amp; 5</td>
</tr>
</tbody>
</table>

Modified from Nurhasan (2021) and Pribowo (2018)

Furthermore, the data generated were processed using quantitative descriptive analysis techniques, which were then interpreted qualitatively. After validation and product improvement from the validation results, the learning media becomes an internally tested product design (Sugiyono, 2016). The results of the questionnaire were categorized based on the percentage of feasibility produced, and the category was divided into five ranges in the table below.

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>81%-100%</td>
<td>Very good</td>
</tr>
<tr>
<td>61%-80%</td>
<td>Good</td>
</tr>
<tr>
<td>41%-60%</td>
<td>Good enough</td>
</tr>
<tr>
<td>21%-40%</td>
<td>Not good</td>
</tr>
<tr>
<td>&lt; 21%</td>
<td>Not very good</td>
</tr>
</tbody>
</table>

Source: (Nurhasan, 2021)

The development of augmented reality learning media was designed using the ADDIE model, which has five stages of development. Nevertheless, in this research, the ADDIE model was used only until the development stage.

![Figure 1: Research flow](image-url)

The first was the needs analysis stage in the field, followed by the second stage, namely the design of learning media. The design of augmented reality media was based on the characteristics of fourth-grade elementary school students, learning materials, and the achievements and learning objectives of Sundanese fairy tales. The design of fairy tales in the form of augmented reality included visualization of fairy tale characters, visualization of the setting, a series of scenes and storylines, and
sound to fill the story. The design was then developed in the third stage to become augmented reality learning media for learning Sundanese fairy tales. After this augmented reality media had been developed, validation was carried out by media experts, material experts, and user responses from fourth-grade students in one of the elementary schools in Bandung City. Furthermore, data analysis was carried out using quantitative descriptive analysis so that the media design was internally tested.

RESULTS AND DISCUSSION

Need Analysis

The design of augmented reality learning media for fairy tales must go through three stages to become a product design. The first stage was a needs analysis conducted through interviews and observations. Preliminary studies were carried out in elementary schools in Bandung City with a sample distribution of six elementary school Sundanese language subject teachers and 24 students from elementary schools with excellent, good, and good enough accreditation. The results of the interviews conducted uncovered that the learning media used in Sundanese language learning began to use technology such as projectors to display material. The variety of media used also began to vary in the form of images or audio. Based on the preliminary study, it was found that the language learning media used had begun to utilize technology, but the media was only in the form of images or audio, not yet in the form of audiovisual combinations. Hence, it is necessary to develop fairy tale learning media using audiovisual media, namely augmented reality. Therefore, this research created a design in the form of augmented reality-based interactive learning media in Sundanese fairy tale material to become a variety of Sundanese language learning media.

Design

Augmented reality media was designed through three stages, namely concept formulation, storyboard design, and determining media components (Mustika et al., 2018; Pandansari & Gafur, 2016).

In formulating the media concept, the augmented reality media to be created was formulated in accordance with the learning objectives and target users. In this research, the media was designed to teach fairy tales at the elementary school level. Based on the learning outcomes of Sundanese language subjects at the elementary school level, the fairy tale material presented was a fable, so a fable entitled "Sakadang Peucang Ngalawan Buaya" was chosen.

In designing a storyboard, the next stage of media design preparation was the creation of scenarios for each scene in augmented reality visualization. The fairy tale text "Sakadang Peucang Ngalawan Buaya" was divided into six scenes. Here is the storyboard of augmented reality media.
<table>
<thead>
<tr>
<th>Scene</th>
<th>Design</th>
<th>Description/script</th>
</tr>
</thead>
</table>
| Scene 1 | Lush Forest River Arid Forest Peucang | • Visualization of the setting of “peucang” is a forest in an arid state, a river, and a fertile forest across the river.  
• There is a forest background sound and a narrator voiceover.  
• There is a play button to run each scenario. |
| Scene 2 | Lush Forest River Crocodile Arid Forest Peucang | • The visualization of the unbearably hungry “peucang” has the urge to cross but is aware that many crocodiles are waiting for prey in the river.  
• There is a forest background sound and a narrator voiceover.  
• There is a play button to run each scenario. |
| Scene 3 | Lush Forest River Crocodile Arid Forest Peucang | • The visualization of when the “peucang” tries to cross, but his leg is bitten by the crocodile, so the deer cleverly avoids it.  
• There is a forest background sound and a narrator voiceover.  
• There is a play button to run each scenario. |
| Scene 4 | Lush Forest River Crocodile Arid Forest Peucang | • A display where the crocodile leader dives in to call his friends at the command of “peucang,” and the crocodiles emerge in a row to the surface of the river.  
• There is a forest background sound and a narrator voiceover.  
• There is a play button to |
run each scenario.

Scene 5

- A display of "peucang" jumping over the backs of crocodiles one by one to cross the river
- There is a forest soundtrack and the narrator's voiceover.
- There is a play button to run each scenario.

Scene 6

- In the scene where the "peucang" manages to cross the river with the help of the crocodile, he taunts the crocodile for falling for his clever trick.
- There is a forest background sound and a narrator voiceover.
- There is a play button to run each scenario.

Suitable components were prepared and determined to visualize each story character in the assemblr EDU application. In addition to character visualization, there was also a selection of components for visualizing the setting and other complements to be displayed in augmented reality media. To complete the augmented reality display of fairy tales, forest background sounds, narrator voices, and character voices based on the content of the story were also added to bring the media to life.

Development

The development stage came down to combining components. After selecting the components to be used, each component was arranged per scene in the assemblr EDU application. The fairy tale "Sakadang Peucang ngalawan Buaya" was transformed into augmented reality in six scenes. The following is a view of each scene.

Table 6. Augmented reality media display

<table>
<thead>
<tr>
<th>Scene</th>
<th>View</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scene 1</td>
<td>![Scene 1 Image]</td>
</tr>
</tbody>
</table>

18
At the development stage, not only product development was carried out, but internal validation was also performed by experts. Internal validation was conducted so that after validation, the resulting product became an internally tested design (Sugiyono, 2016). The validation carried out on this augmented reality fairy tale learning media was media validation, material validation, and user validation. Media validation was carried out by two media experts, material validation was carried out by two experts, and user responses were carried out by 24 students. The results of the media expert validation can be seen in the diagram below.
Based on Figure 2, the average value of media validation from two experts was 4.6. Then, the percentage of the feasibility of augmented reality media design of fairy tales was 93.2%, belonging to a very good category. Therefore, augmented reality learning media of Sundanese fairy tales could be implemented in Sundanese language learning. Next, material experts validated the material to see its suitability with fairy tale learning material at the elementary school level. The results of the validation are described in the diagram below.

Judging from the data generated in Figure 3, the average material validation value of augmented reality media was 4.55. Then, the percentage of the feasibility of learning media based on material experts was 91%, which was a very good category. Therefore, the feasibility of the material contained in the media had been internally tested and could be implemented in learning. In addition to media and material validation by experts, tests were also conducted to see user responses to this AR fairy tale learning media. The users chosen to express the response were fourth-grade students, with a total of 24 people. The following are responses from users regarding AR fairy tale learning media.
The diagram illustrates that the average percentage of the feasibility of the responses given by students to augmented reality learning media was 93%, with a very good category. From the three validation results above, the augmented reality media of Sundanese fairy tales had a very good feasibility category. Therefore, the learning media for fairy tales in the form of augmented reality could begin to be implemented in Sundanese language learning, especially fairy tale material.

Fundamentally, in the Sundanese language learning process, support and facilities that can attract attention to achieve learning goals are needed. This augmented reality learning media for Sundanese fairy tales was designed to be a variation of Sundanese language learning media. This AR media can be used to make learning more interesting and increase students' learning motivation (Carolina, 2022; Gumilang, 2023; Indahsari & Sumirat, 2023). Motivation is needed so that students can achieve learning completeness; therefore, supporting media is required to facilitate this goal. Augmented reality can help students achieve learning completeness indicators (Wati et al., 2023). With this goal, augmented reality media can begin to be developed to become learning media, including Sundanese language learning.

Augmented reality is a technology that combines two-dimensional or three-dimensional virtual objects into a three-dimensional real environment and then projects these virtual objects in real-time and real places (Gumilang, 2023; Gunawan, 2023; Sari et al., 2022). Students will feel the real experience when augmented reality is used to describe learning materials. Moreover, the augmented reality media design is accompanied by the addition of audio story content, which makes the product include interactive audiovisual media. Virtual objects that are the implementation of learning materials can be seen, listened to, and used as if they are real so that they can attract the attention of students. This augmented reality learning media product of Sundanese fairy tales is not only interesting but also in accordance with learning materials at the elementary school level so that the material can be conveyed and the lesson objectives can be achieved. This can be seen from the validation results of media and material experts who gave a percentage of eligibility of 93.2% and 91% in the very good category on this Sundanese fairy tale AR media. Thus, it is expected that augmented reality can help improve students' understanding, stimulate mindsets, improve critical thinking skills, and implement material in everyday life (Dewi & Sahrina, 2021; Socrates & Mufit, 2022; Zulfa et al., 2023).

Since augmented reality-based learning media for learning Sundanese fairy tales have not been developed, it is necessary to develop them to help learning activities become more interesting while conveying the material and learning objectives. As such, the design of augmented reality fairy tales needs to be continued until the implementation stage to see the effect of media on learning. Based on validation conducted by media experts, material experts, and users of augmented reality, the media
design developed could be categorized as very good, with an average percentage of eligibility reaching 92.4%. According to the results of validation data processing, the quality of this Sundanese fairy tale augmented reality media could help improve students' understanding of Sundanese fairy tale material. It implies that using augmented reality media can color the use of digital media in Sundanese language learning as an alternative solution to improving students' ability to understand Sundanese fairy tales. Therefore, the products resulting from this research can be implemented in Sundanese language learning at the elementary school level as interactive learning media. In this study, the stages were taken only up to the development stage to produce ready-to-be-tested products.

CONCLUSIONS AND RECOMMENDATIONS

To achieve learning objectives and indicators of learning completeness, adequate learning facilities are needed. One of these facilities is learning media. Variations in learning media used can improve students' motivation and quality of learning. Augmented reality is one option that can be used as learning media, providing a real experience in learning. This Sundanese fairy tale AR media design can be used to support learning on fairy tale material so that students can see the scene directly from the contents of the fairy tale. The product produced in this study was augmented reality media of Sundanese fairy tales at the elementary school level. The resulting product was internally validated by media experts, material experts, and users, with an average percentage of eligibility of 92.4% in the very good category. Therefore, this augmented reality-based learning media product can begin to be used in the world of education. In this study, the stages carried out were only up to the development stage, which produced learning media products. Therefore, it is expected that future research will focus on the implementation and trial of augmented reality learning media in Sundanese language learning.

REFERENCES


Sugiarto, & Farid, A. (2023). Literasi digital sebagai jalan penguatan pendidikan karakter di era society


