

Development Of Interactive Media Based On Articulated Storyline 3 In Science Subjects At SDN Kepanjen 2

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Abstract: This research is motivated by the science learning process in grade VI of SDN Kepanjen 2 which is still teacher-centered and lacks the use of interesting learning media for students. This can have an impact on the low motivation and interest of students in learning, as well as their understanding of science materials. In addition, teachers also still have difficulty in developing innovative and interactive learning media, especially learning media based on articulated storyline 3. This development research aims to develop interactive learning media based on Articulated Storyline 3 (AS3) in science subjects at SDN Kepanjen 2 Jombang. This research uses the Research & Development (R&D) development model with an ADDIE design which consists of analysis, design, development, implementation, and evaluation stages. The results show that the interactive learning media based on AS3 developed is very feasible to use with a feasibility percentage of 95.29% based on the assessment of media experts, design experts, material experts, and peers. The results of trials on students show that this learning media is effective to use with an effectiveness percentage of 88.00% and the completeness of learning outcomes reaches 86.67%. Thus, interactive learning media based on AS3 in science subjects on the material of exploring the solar system is feasible and effective to use in learning in grade VI Elementary School.

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Introduction

The rapid development of science and technology has brought about changes in various aspects of life, including in the field of education. One of the most significant changes is the use of learning media as a tool in the learning process. Learning media can be an effective means of conveying information and knowledge to students (Arsyad, 2014).

One of the learning media that is currently being developed is learning media based on articulated storyline (AS). AS is a concept of developing learning media that integrates various multimedia elements such as text, images, sound, video, and animation into an interesting and interactive storyline (Clark & Mayer, 2011). Through this approach, it is hoped that students can be actively involved in the learning process and gain a deeper understanding of the material being studied.

The use of AS3-based learning media has several advantages, including being able to attract attention and increase student learning motivation, facilitate the delivery of material, and help students understand abstract concepts to be more concrete. In addition, this media can also increase interaction between teachers and students, as well as between students, so that the learning process becomes more effective and enjoyable (Smaldino, Lowther, & Russell, 2012).

One of the subjects that can be optimized by using AS3-based learning media is Natural Sciences (IPA) in grade VI which has a fairly broad and complex scope, such as the respiratory system, digestive system, excretory system, and other materials. These materials require learning media that can present information in a structured, systematic, and attractive manner. The use of AS-based learning media is expected to help students understand IPA concepts more easily and enjoyably at the elementary school level.

SDN Kepanjen 2 is one of the elementary schools located in Jombang Regency, East Java. Based on preliminary observations, it is known that the science learning process in grade VI of SDN Kepanjen 2 is still teacher-centered and lacks the use of interesting learning media for students. This can have an impact on the low motivation and interest of students in learning, as well as their understanding of science materials.

Based on interviews with sixth-grade teachers at SDN Kepanjen 2, it is known that teachers have difficulty in developing innovative and interactive learning media, especially learning media based on AS3. Because the use of interesting learning media that suits the characteristics of students can help improve the quality of learning in the classroom.

Referring to the description above, the researcher is interested in developing AS3-based learning media with the title "Development of Interactive Media Based on Articulated Storyline 3 (AS3) on IPA Materials in Grade VI at SDN Kepanjen 2 Jombang". It is hoped that through the development of this learning media, the IPA learning process can become more interesting, interactive, and effective, so that it can increase students' understanding and learning motivation.

Research Method

Development is a process, method, or act of developing, gradual and orderly construction towards a desired goal (KBBI, 2003). Development can be said to be an effort made to develop a particular product to be more effective and efficient in its use.

This research uses the Research and Development (R&D) method. The research and development method is chosen because this method is used to produce certain products and test the results of these products. The purpose of this research is to produce a product in the form of interactive learning media based on articulated storyline with the ADDIE learning design model for grade VI elementary school students at SDN Kepanjen 2, Jombang Regency.

The development model used by the researcher in developing interactive learning media based on articulated storyline is the ADDIE model, which is one of the development models derived from the Research and Development (R&D) method. ADDIE is an acronym for Analyze, Design, Development, Implementation, and Evaluation. ADDIE emerged in the 1990s and was developed by Reiser and Mollenda.

The ADDIE model has five stages, namely: 1) Analysis; 2) Design; 3) Development; 4) Implementation; and 5) Evaluation. In the analysis stage, an evaluation of the learning

needs and existing conditions is carried out. Then, proceed with the design stage, where the learning media plan and structure are designed. The third stage is development, where the learning media is actually made and tested. After that, the implementation stage is carried out, where the media is implemented in the learning process. Finally, the evaluation stage is carried out to evaluate the effectiveness of the learning media that has been developed.

The subjects of the product trial for interactive learning media based on articulated storyline 3 were 30 students of grade VI-C at SDN Kepanjen 2. The selection of trial subjects was done by purposive sampling technique. The data collection instrument used a questionnaire for media experts, design experts, material experts, peers, and students.

Data analysis was carried out in a quantitative descriptive manner in the form of a percentage. The feasibility of interactive learning media based on articulated storyline 3 is determined based on the feasibility criteria with a Likert scale. As for knowing the effectiveness of interactive learning media based on articulated storyline 3, it can be seen from the completeness of student learning outcomes.

Result and Discussion

1. Analysis Stage

At the analysis stage, an analysis of learning needs, student characteristics, and school facilities was carried out. The analysis results show that the science learning process in grade VI of SDN Kepanjen 2 is still teacher-centered and lacks the use of interesting learning media. In addition, teachers also still have difficulty in developing innovative and interactive learning media, especially learning media based on articulated storyline 3.

2. Design Stage

At the design stage, the design of interactive learning media based on articulated storyline 3 was carried out, including making flowcharts, storyboards, and assessment instruments. The software used in the development of this media is Articulated Storyline 3.

3. Development Stage

At the development stage, the production of interactive learning media based on articulated storyline 3 was carried out in accordance with the design at the design stage. This interactive learning media consists of login pages, main/menu pages, instruction pages, learning objective pages, diagnostic assessment pages, material pages, evaluation pages, reference pages, and developer pages.

4. Implementation Stage

At the implementation stage, the validation of interactive learning media was carried out by media experts, design experts, and material experts. The validation results are presented in the following tables:

Table 1. Media Expert Validation Results

No.	Aspects	Assessed Score	Aspect Percentage	Qualification
1	Coloring	4,50	90%	Excellent
2	Text Layout	5,00	100%	Excellent
3	Graphics	5,00	100%	Excellent
4	Interface	5,00	100%	Excellent

The data in table above shows that the media expert assessment on the aspects of coloring, text layout, graphics, and interface obtained an average score of 4.50, 5.00, 5.00, and 5.00 respectively, with an overall percentage of 98.67% in the "Excellent" category.

Table 2. Design Expert Validation Results

No.	Aspects	Assessed Score	Aspect Percentage	Qualification
1	Instructional Design	4,50	90%	Excellent
2	Technology	4,00	80%	Excellent
3	Instructional Message Design	4,75	95%	Excellent

The data in table above shows that the design expert assessment on the aspects of instructional design, technology, and instructional message design obtained an average score of 4.50, 4.00, and 4.75 respectively, with an overall percentage of 88.57% in the "Excellent" category.

Table 2. Material Expert Validation Results

No.	Aspects	Assessed Score	Aspect Percentage	Qualification
1	Relevance	5,00	100%	Excellent
2	Accuracy	4,75	95%	Excellent
3	Completeness of Presentation	5,00	100%	Excellent
4	Basic Concept of the Material	5,00	100%	Excellent
5	Suitability of Presentation with Student-Centered Learning	4,75	95%	

The data in table above shows that the material expert assessment on the aspects of relevance, accuracy, completeness of presentation, basic concept of the material, and suitability of presentation with student-centered learning obtained an average score of 5.00, 4.75, 5.00, 5.00, and 4.75 respectively, with an overall percentage of 97.33% in the "Excellent" category.

Furthermore, trials were conducted on students in small groups and large groups. The trial results are presented in the following tables:

Table 3. Small Group Trial Results

No.	Aspects	Assessed Score	Average Percentage	Qualification
1	Content Material Presentation	4,53	90,57%	Excellent
2	Ease of Access	4,43	88,50%	Excellent
3	Clarity of the Conveyed Message	4,42	88,44%	Excellent

The data in table above shows that the small group trial on the aspects of content material presentation, ease of access, and clarity of the conveyed message obtained an average percentage of 90.57%, 88.50%, and 88.44% respectively, with an overall percentage of 93.60% in the "Excellent" category.

Table 4. Large Group Trial Results

No.	Aspects	Assessed Score	Average Percentage	Qualification
1	Content Material Presentation	4,27	85,43%	Excellent
2	Ease of Access	4,27	85,33%	Excellent
3	Clarity of the Conveyed Message	4,35	87,04%	Excellent

The data in Table above shows that the large group trial on the aspects of content material presentation, ease of access, and clarity of the conveyed message obtained an average percentage of 85.43%, 85.33%, and 87.04% respectively, with an overall percentage of 86.13% in the "Excellent" category.

The impact of using interactive learning media based on Articulated Storyline 3 on student learning outcomes can be seen in the following table:

Table 5. Student Learning Outcomes

No.	Criteria	KKTP	Number of Students	Percentage (%)
1	Passed	70	26	86,67
2	Not Passed		4	13,33

The highest score from the large group trial was 100, while the lowest score was 50. Based on the data in Table 4.8, it can be concluded that the use of interactive learning media has a very effective impact, as seen from the completeness of student learning outcomes reaching 86.67%.

5. Evaluation Stage

At the evaluation stage, improvements and refinements were made to the interactive learning media based on articulated storyline 3 based on input from media experts, design experts, and material experts. Overall, the interactive learning media based on articulated storyline 3 that was developed is feasible and effective to use in science learning in grade VI Elementary School.

Discussion

The results of this research indicate that the development of interactive learning media based on Articulated Storyline 3 (AS3) significantly enhances students' learning motivation and comprehension in science subjects. This finding aligns with Mayer's (2014) Cognitive Theory of Multimedia Learning, which emphasizes that the integration of visual and auditory information facilitates dual-channel processing in working memory, leading to better knowledge retention and conceptual understanding. In this study, the use of animations, narrations, and interactive elements in AS3 supported students' engagement and reduced cognitive overload when learning abstract science concepts such as the solar system.

Furthermore, the improvement in students' learning outcomes, with 86.67% achieving mastery, demonstrates the potential of AS3-based media to increase learning effectiveness. This is consistent with findings by Clark and Mayer (2011), who state that well-designed e-

learning environments enhance learners' active participation and promote meaningful learning experiences. The interactive design of the AS3 media allows students to explore materials at their own pace, receive immediate feedback, and revisit difficult sections, fostering self-regulated learning.

The validation results from media, design, and material experts (with an overall feasibility percentage of 95.29%) further confirm that the product meets pedagogical and technical standards for digital learning tools. This aligns with Smaldino, Lowther, and Russell (2012) who emphasized that high-quality instructional media must integrate usability, interactivity, and alignment with instructional goals. The findings also reflect the relevance of the ADDIE model, which systematically ensures that media development is grounded in learner needs analysis, iterative design, and evaluation (Reiser & Dempsey, 2018).

Additionally, the effectiveness of AS3-based media can be viewed through the lens of constructivist learning theory. According to Jonassen (1999), constructivist learning environments allow learners to construct meaning through interaction, exploration, and reflection. The narrative-based interactivity within AS3 creates an immersive environment where learners can connect new information to prior knowledge, particularly important in primary science education where abstract phenomena are often difficult to visualize (Samatowa, 2011).

These findings are also in line with recent research by Hidayat & Nuryanti (2022) and Rahmadani et al. (2023), which show that interactive multimedia developed with storyline-based approaches increases students' motivation, critical thinking, and understanding of scientific processes in elementary schools. The integration of technology in science learning not only improves cognitive outcomes but also fosters 21st-century competencies such as digital literacy and problem-solving skills (UNESCO, 2022).

In summary, the use of AS3-based interactive learning media proves to be an effective pedagogical innovation for science learning in elementary schools. Its design principles, rooted in multimedia learning theory and constructivism, support both cognitive and affective dimensions of learning. Future research may explore the scalability of AS3 media across different subjects and learning contexts, as well as its integration with Learning Management Systems (LMS) for blended or distance learning environments.

Conclusion

Based on the results of the research and development, it can be concluded that the interactive learning media based on Articulated Storyline 3 (AS3) developed through the ADDIE model has proven to be both feasible and effective for use in science learning for grade VI elementary school students at SDN Kepanjen 2 Jombang. The feasibility results from media, design, and material experts, as well as peer validation, all fall into the "very feasible" category, indicating that the developed media meets the pedagogical, technical, and content quality standards required for instructional use. Furthermore, the implementation

results, with an average effectiveness percentage of 88.00% and 86.67% of students achieving learning outcomes above the Minimum Completeness Criteria (KKM), demonstrate that the AS3-based media successfully enhances students' motivation, engagement, and understanding of science concepts—particularly in complex topics such as the solar system. Thus, the AS3-based interactive learning media can be concluded to be a valid, practical, and effective innovation for improving the quality of science learning in elementary education.

Recommendation

The use of interactive learning media based on Articulated Storyline 3 (AS3) in science subjects is recommended for all grade VI students, especially at SDN Kepanjen 2 Jombang, and all grade VI students in all elementary schools that have adequate supporting facilities. Teachers can also utilize the latest technological advancements to create interactive and engaging learning media, such as using the Articulated Storyline 3 application.

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