

Development of ALAMEDIA Interactive Multimedia Based on Articulate Storyline to Improve Learning Outcomes in Science for Fourth Grade Students

Alya Putri Maradika Ningrum¹, Ika Ratnaningrum²

Universitas Negeri Semarang¹²

alyaputri0817@gmail.com¹²

ABSTRAK

Ilmu Pengetahuan Alam dan Sosial (IPAS) merupakan mata pelajaran wajib dalam Kurikulum Merdeka yang harus dikuasai oleh siswa. Namun, keterbatasan dalam penggunaan media pembelajaran, khususnya pada mata pelajaran sumber daya alam dan bentang alam, menjadi salah satu faktor yang menyebabkan rendahnya pemahaman siswa terhadap mata pelajaran tersebut. Oleh karena itu, penelitian ini bertujuan untuk merancang dan mengembangkan perangkat multimedia interaktif berbasis Articulate Storyline untuk siswa kelas IV SD Negeri Sudirman Kecamatan Ambarawa Kabupaten Semarang. Penelitian ini menggunakan pendekatan Research and Development (R&D) dengan model pengembangan ADDIE yang meliputi tahapan analisis, desain, pengembangan, implementasi, dan evaluasi. Subjek penelitian adalah siswa kelas IV SD Negeri Sudirman Kecamatan Ambarawa Kabupaten Semarang Tahun Pelajaran 2024/2025. Hasil validasi ahli materi dan ahli media menunjukkan bahwa media yang dikembangkan memperoleh skor kelayakan sebesar 93% dengan kategori sangat layak. Penilaian praktikalitas mencapai 98% yang menunjukkan bahwa media sangat mudah digunakan. Uji efektivitas menggunakan uji-t menghasilkan nilai signifikansi di bawah 0,05, yang menunjukkan adanya perbedaan yang signifikan antara skor pretest dan posttest. Selain itu, uji N-gain menunjukkan peningkatan hasil belajar berada pada kategori sedang, dengan skor 0,5505 pada skala kecil dan 0,5620 pada skala besar. Guru dan siswa juga memberikan tanggapan sangat positif terhadap media tersebut. Dengan demikian, dapat disimpulkan bahwa multimedia interaktif ALAMEDIA berbasis Articulate Storyline efektif, layak, dan praktis dalam meningkatkan hasil belajar IPA siswa kelas IV.

Kata Kunci: Articulate Storyline; IPAS; Media Pembelajaran

ABSTRACT

Natural and Social Sciences (IPAS) is a compulsory subject in the Merdeka Curriculum that students must master. However, limitations in the use of learning media, particularly in the areas of natural resources and landscapes, are one of the factors contributing to students' low understanding of these topics. Therefore, this study aims to design and develop an interactive multimedia tool based on Articulate Storyline for fourth-grade students, with a focus on the topics of natural resources and landscape. The research uses a Research and Development (R&D) approach with the ADDIE development model, which includes the stages of analysis, design, development, implementation, and evaluation. The research subjects are fourth-grade students at SD Negeri Sudirman, Ambarawa District, Semarang Regency, in the 2024/2025 academic year. The validation results from subject matter and media experts indicated that the developed media achieved a feasibility score of 93%, categorized as highly feasible. The practicality assessment reached 98%, indicating that the media is very easy to use. The effectiveness test using a t-test yielded a significance value below 0.05, indicating a

significant difference between pretest and posttest scores. Additionally, the N-gain test showed an improvement in learning outcomes in the moderate category, with a score of 0.5505 on the small scale and 0.5620 on the large scale. Teachers and students also gave very positive feedback on the media. Therefore, it can be concluded that the interactive multimedia ALAMEDIA based on Articulate Storyline is effective, feasible, and practical in improving the learning outcomes of fourth-grade students in Science.

Keywords: Articulate Storyline; IPAS; Learning Media

INTRODUCTION

Education plays an important role in an individual's life and is the main foundation for the progress of a nation. The progress of a country is largely determined by the quality of its education (Nurmala et al., 2021). Education can be defined as a systematic process that enables students to understand knowledge, develop critical thinking skills, and build better character (Rahayu et al., 2023).

The development of technology today has become an integral part of human life, where almost all aspects of life utilize it, including in the world of education (Syam, 2023). The continuous advancement of technology is not only a challenge but also offers solutions to various problems, especially in the education sector. One of its uses in education is the creation of educational media. Students are often more engaged in technology-based learning media since the content offered is not confined to traditional lecture approaches. However, the use of technology in the learning process has its own set of issues, one of which is the risk of over-reliance on digital gadgets (Xuan & Della, 2024). Poorly constructed technology-based learning resources can have a negative impact on their efficacy. As a result, educators must be able to handle and manage learning technology in order to fully utilize it (Alyusfitri et al., 2024).

The combination of all of these content pieces creates learning media that can increase learners' interest and desire to study (Nabilah et al., Rianto in Kusuma & Ahmadi, 2024).

The Problem of The Study

Observations at SD Negeri Sudirman show that fourth-grade students have difficulty understanding IPAS lessons, particularly on the topic of "My Region is Rich in Resources." The main obstacles faced are a lack of learning media and the difficulty of providing real examples of non-renewable natural resources. In addition, the teaching methods used are still conventional, namely assigning students to discuss and present material without intensive guidance. The lack of variety in methods and media makes learning feel less interactive and does not provide optimal space for students to express themselves (Zubaedah et al., 2024). Currently, there are no effective media to convey this material. This makes the learning process less interactive due to the lack of communication between teachers and students.

The use of technology in education is one strategic option for developing engaging and creative learning materials. One type of technology deployment is the

use of interactive media based on Articulate Storyline (Nissa et al., 2021). Articulate Storyline is a software developed to create interactive learning material and help students enhance their critical thinking abilities (Mustika et al., 2025). In terms of appeal and functionality, this application is comparable to other interactive media creation software such as Macromedia Flash and Adobe Flash (Hidayati et al., 2024). This application provides various user-friendly features, such as inserting images, characters, videos, timelines, and quiz formats, making it one of the forms of interactive multimedia based on technology. The application of technical and creative talents enables teachers to create more interesting learning presentations and urges students to participate more actively in the learning process (Wahyuni et al., 2023).

Research's State of the Art

This study is backed by several prior studies on the creation and efficacy of Articulate Storyline-based instructional material. Zahratunnisa, M.D., and colleagues conducted research titled "Developments of Articulate Storyline of Human Respiratory System Materials in V-Class Students at Pati." This study emphasizes the need to employ IPAS learning media, which integrates auditory and visual features, to address the restricted usage of media in the teaching and learning process. The research uses the ADDIE development paradigm and focuses on human respiratory system materials for fifth-graders. The study's findings show that the generated learning materials are highly valid, with validation ratings of 95.5% from subject matter experts and 95.25% from media specialists. This validation addresses issues such as software engineering, media usability, visual communication, and layout. Based on these findings, Articulate Storyline-based media is regarded as appropriate and creative for use by instructors in the classroom.

Another supporting study was conducted by Daryanes, F., and his team, titled "The Development of Articulate Storyline Interactive Learning Media Based on Case Methods to Train Student's Problem-Solving Ability." This study focused on developing interactive learning media using Articulate Storyline based on case methods to enhance the problem-solving abilities of biology education program students. Using the ADDIE model, this study addressed the issue of low analytical skills among students, as reflected in their learning outcomes. Validation findings revealed that the developed media obtained scores of 3.9 from subject matter experts, 3.69 from media experts, and 3.47 from pedagogical experts, all of which are classified as extremely valid to valid. These findings add to the evidence that interactive learning tools, such as Articulate Storyline, may help students enhance their critical thinking and problem-solving abilities.

Novelty, Research Gap, & Objective

This study aims to develop technology-based learning media using Articulate Storyline. The innovation offered is the integration of quiz features in the application with Google Forms so that teachers can monitor student evaluation results. This addresses the limitation of the quiz feature in Articulate, which does not provide data storage for student answers. Additionally, this research focuses on the topic of natural

resources and landscapes, which has not been extensively developed in similar media. The study is centred on the development of interactive multimedia using Articulate Storyline with the material "My Region is Rich in Resources," which covers topics related to natural resources and landscapes. The research gap lies in the lack of studies that specifically review the stages of developing interactive learning media based on Articulate Storyline for this material, particularly in the context of IPAS learning in elementary schools. The problem underlying this research was found through observation at SD Negeri Sudirman Ambarawa, namely the low learning outcomes of students in IPAS subjects. One of the contributing factors is the absence of appropriate and engaging learning media to effectively convey the material.

Student participation during learning activities remains low, thereby impacting their understanding and learning outcomes. In this context, technology-based learning media offer a promising alternative to enhance students' active engagement in the learning process. When students are directly involved through engaging interactive media, their understanding of the material tends to be deeper, which ultimately can drive improvements in learning outcomes.

This study aims to develop an interactive multimedia learning media product called ALAMEDIA, created using Articulate Storyline. The selection of this platform is based on the characteristics of students at SD Negeri Sudirman Ambarawa, who tend to prefer technology-based learning approaches. Thus, the primary focus of this research is to produce educational media that aligns with the needs and characteristics of students while providing practical solutions for teachers to deliver content in a more engaging and innovative manner. The findings of this research are expected to contribute not only to improving the quality of education at the school but also serve as a reference for teachers and other researchers interested in developing technology-based educational media.

METHOD

Type and Design

This study used a quantitative technique, and the kind of research was Research and Development. R&D is a scientific approach to doing research, designing, manufacturing, and testing the efficacy of a product (Sugiyono, 2023: 396). This study's development model is a descriptive procedural model, known as the ADDIE model. This paradigm is divided into five systematic stages: analysis, design, development, implementation, and evaluation, which are completed sequentially (Hidayat & Nizar, 2021).

According to the processes in the ADDIE paradigm, the development of interactive learning media based on the Articulate Storyline in this study will take place through many stages, namely:

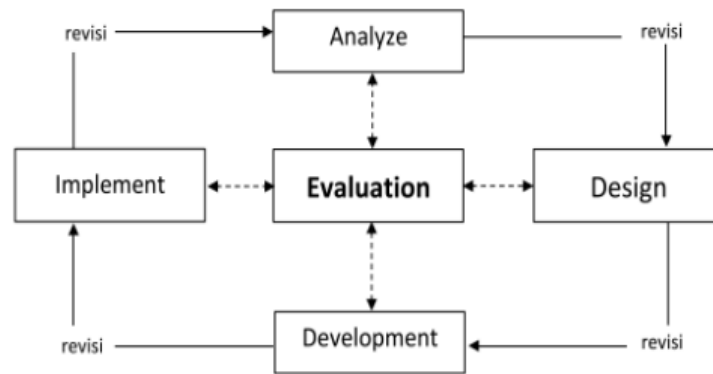


Figure 1. Development Steps

The development of interactive learning media based on Articulate Storyline in this study followed the five stages of the ADDIE model, which are described as follows: 1. Analysis Stage: In this initial stage, information related to the needs for developing learning media was collected through various methods such as interviews, direct observation, and questionnaires distributed to teachers and students. The aim was to identify learning needs in depth. 2. Design Stage: In the design phase, a prototype is developed, which includes the design of the material, learning objectives, and the planning of learning outcomes (CP) and learning objectives (TP). Additionally, evaluation instruments in the form of quiz questions are prepared to measure learning outcomes. 3. Development Stage: After the design is finalized, the development of the learning media begins. This Articulate Storyline-based media is then fully developed and undergoes a validation process conducted by subject matter experts and media experts to ensure the quality of content and presentation. 4. Implementation Stage: In this stage, the learning media is tested through two group scales, namely small groups and large groups. This testing aims to obtain feedback from teachers and students regarding the use of ALAMEDIA learning media in the learning process. 5. Evaluation Stage: Evaluation is conducted based on data obtained during implementation. The assessment covers the effectiveness and quality of the media, as well as product improvements to enable broader use. Evaluation is also used to identify areas that need improvement to enhance the quality of the learning media.

Data and Data Sources

Data was collected using a variety of methodologies, including observation, interviews, documentation, learning test results, and questionnaires completed by teachers and students. This study was carried out in SD Negeri Sudirman, which is in Ambarawa District, Semarang Regency. The research included all 21 fourth-grade pupils. Six students participated in the small-scale study, while the remaining 15 students took part in the large-scale trial. The sampling strategy utilized was non-probability sampling with a saturation sampling approach, with the full class population serving as the research sample.

Data Collection Technique

This study uses both primary and secondary data. Primary data refers to material gathered directly by the researcher through interviews with instructors and observations of learning activities. Secondary data is information received from third parties, such as the learning outcomes of fourth-grade children on the topic "My Region is Rich in Resources," which were obtained with permission from the homeroom teacher. All obtained data will be examined using relevant statistical methods to assess the implementation, practicality, and efficacy of the generated learning materials. Table 1 shows details on the data categories, respondents, and media enhancements.

Table 1. Data Collection Instruments

Data Type	Data Collection Instruments	Respondents
Needs Analysis	Questionnaire on the needs of students and teachers	Students and teachers
Product Validity	1. Survey of subject matter experts' approval 2. Survey of media experts' approval	1. Subject Matter Experts 2. Media Experts
Product and Data Practicality	Questionnaire on student and teacher responses	Students and teachers
Product Effectiveness Data	Evaluation questions	Students

Data Analysis

In this study, the data collected included assessments of the suitability of learning media by subject matter experts and media experts, as well as student learning outcomes obtained from pretest and posttest results. Each type of data was analyzed separately based on relevant components, with the following details:

Analysis of Learning Media Validity Data

To assess the feasibility of the learning media that had been developed, an assessment instrument was used and filled out by experts. The data from this assessment was analyzed using the percentage correction method because it was considered more efficient and easier to apply. This assessment referred to a 4-point Likert scale, and the calculation was performed using the following percentage formula.

$$NP = \frac{R}{SM} \times 100$$

Explanation:

NP = percentage value sought

R = raw score obtained

SM = maximum score

100 = fixed number

The percentage result of the eligibility data is then converted using the criteria below.

Table 2. Criteria for the Feasibility of Interactive Multimedia Based on Articulate Storyline

Percentage %	Criteria
0% - 20%	Highly Inappropriate
21% - 40%	Inappropriate
41% - 60%	Less Appropriate
61% - 80%	Appropriate
81% - 100%	Highly Appropriate

(Riduwan (2012:14) in (Astutik et al., 2021:547))

Analysis of Learning Media Effectiveness Data

The effectiveness of learning media was assessed using student learning outcomes, which were calculated based on average learning accomplishment scores for the topic delivered. To examine these learning results, a normality test was performed using the Shapiro-Wilk method and SPSS version 21 software. In addition, the N-gain exam was used to assess increases in student knowledge before and after media consumption. This exam is designed to assess the degree of progress in learning outcomes from the pretest to the posttest. The normalized gain formula is as follows.

$$N - Gain = \frac{\text{post test score} - \text{pretest score}}{\text{maximum score} - \text{pretest score}}$$

The results were then classified according to the following criteria.

Table 3. Interpretation of the Gain Index

Nilai N-Gain	Kriteria
N-gain ≤ 0,30	Low
0,30 < N-gain < 0,70	Moderate
N-gain ≥ 0,70	High

(Hake (1999) in Astutik et al., (2021:548))

RESULTS AND DISCUSSION

Results

The ALAMEDIA interactive multimedia based on Articulate Storyline was developed using the ADDIE development paradigm, which comprises five major stages: analysis, design, development, implementation, and evaluation. Each stage of this strategy was carried out in a methodical manner to develop effective learning

products that match the requirements. The results from each stage are provided below.

Analysis

The analysis stage began with preliminary research conducted in the fourth grade of SD Negeri Sudirman Ambarawa. The techniques used included interviews, observations, and documentation to identify the need for the development of interactive multimedia based on Articulate Storyline. The instruments used were questionnaires distributed to teachers and students to obtain data on learning media needs. The analysis results showed that teachers had not optimally utilized learning media in delivering material. The learning process was still limited to the students' daily experiences, which resulted in a low level of understanding of the teaching material. Furthermore, students expressed a preference for technology-based instruction, such as informative movies and interactive quizzes. Based on these findings, the creation of interactive multimedia using Articulate Storyline was regarded as a viable method for increasing student engagement and knowledge. This platform includes quiz tools that allow teachers to directly assess student knowledge. In general, the goal of using technology-based interactive multimedia is to provide information in a more effective, efficient, and understandable manner (Manurung, 2020). As a result, developing ALAMEDIA with an Articulate Storyline is a relevant strategy for providing engaging learning and minimizing student boredom while studying.

Design

The design stage involves a systematic planning process for the learning media to be developed. Activities begin with formulating learning objectives that are aligned with the material, organizing the learning activities, organizing the content, designing the media display, and developing assessment instruments to evaluate the quality of the product. The determination of appropriate learning objectives is one of the key characteristics in selecting learning media (Fadjarajani et al., 2020).

In this stage, learning materials are collected from various sources with the help of supporting software. The design results are presented in the form of interactive multimedia ALAMEDIA based on Articulate Storyline, which includes several main menus, such as usage instructions, learning materials, interactive quizzes, and a bibliography. Additionally, this media is equipped with interactive navigation buttons to facilitate learners in accessing each page section independently. The multimedia design is aligned with the fundamental principles of multimedia, which aim to convey information interactively to create an effective and efficient learning process by engaging student activity (Syafitri et al., 2024). The development of the media also considers the cognitive and affective developmental characteristics of students, so that the resulting product meets their learning needs (Bang et al., 2023). In addition, instructional videos are incorporated into the media design as an effort to clarify the presentation of material visually and in depth (Marpelin et al., 2023).

Development

The development stage produces various learning components, such as teaching materials and learning media, which are then validated by material experts and media experts. ALAMEDIA interactive multimedia is developed based on a pre-designed design, taking into account the systematic content and structured presentation of the material. Each element in the media is adjusted to the learning outcomes that have been determined. The results of this interactive multimedia development design are displayed in the form of a visual display as follows.



Figure 2. Login Page and Instructions



Figure 3. Main Menu Page and Materials



Figure 4. Quiz Page and Bibliography

This stage is in line with the main objectives of developing learning media, namely to maintain consistency between the material presented and the learning objectives and to help students stay focused on following the learning process (Maghfiroh & Suryana, 2021). The validation process by material experts and media experts plays an important role in assessing the quality and feasibility of Articulate Storyline-based ALAMEDIA interactive multimedia products. Through this stage, researchers obtained various inputs and suggestions from the validators which were

then used as the basis for making revisions to the product, resulting in better media and suitable for use in the learning process.

Table 4. Validation Results of Material Experts and Media Experts

Aspect	Validation Index (%)	Description
Ahli Materi	93,42	Highly Appropriate
Ahli Media	93,33	Highly Appropriate

Based on Table 4, the results of the assessment given by the material expert validator of the ALAMEDIA interactive multimedia show a feasibility percentage of 93.42%, which is categorized as highly appropriate. This assessment covers several aspects, namely material competence, suitability of material content, and language use. The input from the material expert validators includes suggestions for linking learning content to the context of students' daily lives in their neighborhoods. This aims to make it easier for students to understand the material because it is presented contextually. In addition, the validator also recommended that more specific and familiar examples of non-renewable natural resources be provided, because the examples previously used were still unfamiliar and had the potential to confuse students in distinguishing between types of natural resources.

Meanwhile, the results of the assessment given by the media expert validator obtained a score of 93.33%, which is also included in the category highly appropriate for use in learning. The aspects assessed include design suitability, visual appearance, ease of use, and media excellence. Input from the media expert validator was related to navigation in the media. The validator suggested adjusting the "exit" button to make it less conspicuous, as well as adding a "back" or "preview" navigation button that was previously unavailable. The addition of this button is considered important so that learners can easily return to the previous page without having to repeat from the beginning, thus increasing the convenience of using the media interactively.

Implementation

After obtaining input and assessment from material expert validators and media experts, as well as making revisions according to the suggestions given, ALAMEDIA interactive multimedia products were then tested on two scales, namely small groups and large groups. The initial trial was conducted in a small group consisting of six fourth grade students. After the learning process was complete, both learners and teachers were asked to fill out a questionnaire containing nine questions. This questionnaire was designed to explore their experiences and responses while using the developed product. Assessment of the practicality of the Articulate Storyline-based ALAMEDIA interactive multimedia was conducted through a questionnaire distributed to teachers and learners. The aspects assessed in this questionnaire include interface appearance, component completeness, and suitability of learning materials. The results of this practicality test will be the basis for further evaluation before the media is used on a wider scale.

Table 5. Questionnaire Results from Students and Teacher

Responden	(%)	Keterangan
Teacher	100	Very Practical
Students (Small Group)	96,29	Very Practical
Students (Large Group)	98,51	Very Practical

Based on Table 5, the responses from teachers and students regarding the use of the ALAMEDIA interactive multimedia, developed using Articulate Storyline, showed highly positive results, with assessment scores exceeding 80%. This outcome indicates that the media is considered very practical for use in the learning process, and therefore no further revisions to the product are necessary (Dwiyanto, A. et al., 2024). These findings reinforce the conclusion that ALAMEDIA interactive multimedia is suitable for daily instructional activities (Ulum et al., 2024).

Following the successful trial with the small group, which required no revisions, the product was subsequently implemented in a larger group consisting of 12 fourth-grade students at SD Negeri Sudirman Ambarawa. This large-group trial focused on the application of ALAMEDIA interactive multimedia in the IPAS subject, specifically on the topic of natural resources and landforms. The purpose of this implementation was to assess the effectiveness of the media, as measured by the achievement of learning objectives and the attainment of the predetermined basic competencies.

Evaluation

The evaluation stage aims to analyze the data obtained throughout the development and implementation process of the interactive multimedia in order to assess the feasibility and effectiveness of the learning media developed. The evaluation was carried out by examining various data, including validation results, practicality tests, and students' learning outcomes after using the media. The evaluation results indicate that the implementation of ALAMEDIA interactive multimedia, developed using Articulate Storyline, had a positive impact on students' learning outcomes. This is evidenced by the increase in pretest and posttest scores, as shown in Table 6. This improvement reflects that the developed media is not only feasible and practical to use, but also effective in enhancing students' understanding of the subject matter.

Table 6. Comparison of Pretest and Posttest Scores

Description	Average	Mean Difference
Pretest Small Group	51,67	25
Posttest Small Group	76,67	
Pretest Large Group	58,33	22,67
Posttest Large Group	81	

Based on Table 6, the average student learning outcomes increased by 25 points in the small-group trial and by 22.67 points in the large-group trial. These results indicate a significant difference in students' learning achievement before and after using the ALAMEDIA interactive multimedia developed with Articulate Storyline for the IPAS subject, specifically the topic "My Region is Rich in Natural Resources" in Grade 4 at SD Negeri Sudirman Ambarawa.

This improvement demonstrates that the use of ALAMEDIA positively influences students' comprehension and learning performance. To measure the effectiveness of the media, a series of statistical tests were conducted, including normality tests to examine data distribution, followed by t-tests to assess the significance of learning outcome differences, and N-Gain tests to evaluate the extent of students' learning improvement.

Table 7. Normality Test Results

Variable	Sig.	Description
Pretest Small Group	0.492	Normal
Posttest Small Group	0.985	Normal
Pretest Large Group	0.452	Normal
Posttest Large Group	0.587	Normal

The Shapiro-Wilk normality test results show significance values greater than 0.05, indicating that the students' learning data were normally distributed, both before and after the implementation of the ALAMEDIA interactive multimedia. This finding validates the use of parametric statistical analysis, specifically the t-test, to determine whether there was a statistically significant difference in students' performance before and after using the media. The results of the t-test analysis are shown in Table 8, comparing both small and large group data. This test serves as a key indicator in evaluating the effectiveness of the media in improving student learning outcomes.

Table 8. T-Test Results Small and Large Groups

Keterangan	Mean	Sig.
Small Group Trial	-25.000	0.000
Large Group Trial	-22.667	0.000

The t-test results for both the small and large groups showed a significance value of 0.00, which is less than the threshold of 0.05. This indicates that there is a statistically significant difference in students' learning outcomes before and after the intervention. Therefore, it can be concluded that the implementation of the ALAMEDIA interactive multimedia, developed using Articulate Storyline, resulted in a significant improvement in students' performance from the pretest to the posttest.

Subsequently, an N-Gain test was conducted to further evaluate the effectiveness of the ALAMEDIA interactive multimedia, as presented in Table 9.

Table 9. N-Gain Test Results Small and Large Groups

Keterangan	Mean
N-Gain Score Small Group	0.5505
N-Gain Score Large Group	0.5620

According to Table 9, the N-Gain score in the small-group trial was 0.5505, and in the large-group trial was 0.5620 both of which fall into the medium category. These findings support the conclusion that the ALAMEDIA learning media, developed with Articulate Storyline, is effective in improving students' academic achievement (Nurmala, S., et al., 2021). Furthermore, based on validation from expert reviewers, responses from teachers and students, and the observed learning outcomes, the ALAMEDIA multimedia can be further developed and expanded for broader implementation in instructional settings.

Discussions

According to Susilo et al. (2023), the implementation of interactive multimedia in the learning process can enhance student engagement, interest, and comprehension. This view is supported by Sari et al. (2024), who state that interactive multimedia has the potential to increase students' motivation and encourage active participation. In addition, Mulyati et al. (2024) argue that interactive multimedia enables students to acquire learning materials more effectively and efficiently. In practice, students operate the media independently, which increases their interest and motivation in learning the IPAS topic "My Region is Rich in Natural Resources." The development of ALAMEDIA interactive multimedia, based on Articulate Storyline, employed the ADDIE model, which consists of five phases: Analysis, Design, Development, Implementation, and Evaluation (Rayanto & Sugianti, 2020). The choice of the ADDIE model was based on its simplicity compared to other development models, as emphasized by Suleman et al. (2019).

The developed multimedia was then validated by expert reviewers and received feedback from both students and teachers. The material expert validation score reached 93.42%, while the media expert score was 93.33%, both of which fall under the category of highly feasible. These findings align with those of Ratnaningsih et al. (2024) in their study "Articulate Storyline 3 Based Interactive Media to Explore Mathematical Communication Ability: Development and Implementation," which reported a validation score of 90%, also categorized as highly feasible. The feasibility of the media was further supported by responses from students and teachers, with satisfaction scores of 97% and 100%, respectively, classifying the media as very practical.

The t-test findings in both small- and large-group trials had a significance value of 0.000, which is less than the 0.05 criterion. The null hypothesis (H_0) is

rejected, while the alternative hypothesis (H_a) is supported, showing that interactive multimedia based on Articulate Storyline improves learning outcomes in the IPAS subject, notably on the topic "My Region is Rich in Natural Resources." Furthermore, an examination of students' learning gains using the N-gain formula found that incorporating interactive multimedia resulted in higher average results. The N-gain was 0.55 in the small-group experiment and 0.56 in the large-group trial. Both numbers fall into the moderate group, suggesting a high level of efficacy. In conclusion, Articulate Storyline-based multimedia can continue to be developed in line with technological advancements, considering learning content, learning objectives, and student needs (Idris et al., 2025).

CONCLUSION AND SUGGESTIONS

Based on the study's findings, it is possible to conclude that the ALAMEDIA interactive multimedia, created with Articulate Storyline, is capable of motivating students and optimizing their learning outcomes in the IPAS subject, specifically in the topic "My Region is Rich in Natural Resources," which is presented in an engaging format. ALAMEDIA's development utilizing the ADDIE paradigm can serve as a reference and theoretical framework for future study on instructional media innovation. The availability of practical interactive multimedia that can be accessed at any time and from any location allows students to engage in autonomous study at home utilizing the media offered. ALAMEDIA can serve as an example of a creative and innovative learning tool that teachers can further develop to support classroom instruction. In addition, Articulate Storyline-based multimedia holds potential for modification and application in other subjects, by adapting it to the relevant competencies and learning objectives.

REFERENCE

- Alyusfitri, R., Gistituati, N., & Fauzan, A. (2024). The effectiveness and relationship of student responses toward learning outcomes using interactive multimedia-based e-modules in elementary schools. *International Electronic Journal of Elementary Education*, 16(5), 573-584. 10.26822/iejee.2024.354
- Astutik, A. F., & Suprijono, A. (2021). Pengembangan Media Komik Digital Dalam Pembelajaran IPS Sebagai Penguatan Karakter Peserta Didik Kelas V SDN Geluran 1 Taman. *Jurnal Education and Development*, 9(3), 542-554. <https://doi.org/10.37081/ed.v9i3.2894>
- Bang, H. J., Li, L., & Flynn, K. (2023). Efficacy of an adaptive game-based math learning app to support personalized learning and improve early elementary school students' learning. *Early Childhood Education Journal*, 51(4), 717-732. <https://doi.org/10.1007/s10643-022-01332-3>
- Daryanes, F., Darmadi, D., Fikri, K., Sayuti, I., Rusandi, M. A., & Situmorang, D. D. B. (2023). The development of articulate storyline interactive learning media based on case methods to train student's problem-solving ability. *Heliyon*, 9(4). <https://doi.org/10.1016/j.heliyon.2023.e15082>
- Dwiyanto, A., Raharjo, T. J., Supriyadi, S., Widiarti, N., Rokhman, F., & Isdaryanti, B. (2024). Pengembangan Game SIRAJA Berbasis Articulate Storyline 3 untuk Meningkatkan Keterampilan Berpikir Kritis Peserta Didik Kelas V. *Ideguru: Jurnal Karya Ilmiah Guru*, 9(3), 1305-1312. <https://doi.org/10.51169/ideguru.v9i3.1105>
- Fadjarajani, S., Indrianeu, T., Haekal, T. M., Purnama, Y. I., Abdullah, G., Saleh, M., ... & Rahmat, A. (2020). Media Pembelajaran Transformatif. *Gorontalo: Ideas Publishing*.
- Hidayat, F., & Muhamad, N. (2021). Model Addie (Analysis, Design, Development, Implementation and Evaluation) Dalam Pembelajaran Pendidikan Agama Islam Addie (Analysis, Design, Development, Implementation and Evaluation) Model in Islamic Education Learning. *J. Inov. Pendidik. Agama Islam*, 1(1), 28-37.
- Hidayati, P. N., Arisyanto, P., & Damayanti, A. T. (2024). Pengembangan Media Pembelajaran Gage (Gaya Dan Gerak) Berbasis Articulate Storyline 3 Pada Siswa Kelas IV Sekolah Dasar. *Jurnal Basicedu*, 8(1), 526-538. <https://doi.org/10.31004/basicedu.v8i1.7145>
- Idris, M., Pramono, S. E., & Yulianto, A. The Influence of Using Articulate Storyline Media on Learning Interest and Results. *Inovasi Kurikulum*, 22(1), 235-248. <https://doi.org/10.17509/jik.v22i1.75994>
- Kusuma, D., & Ahmadi, F. (2024). Interactive Learning Media Based on Articulate Storyline in Social Sciences Learning for Grade V Elementary School. *Mimbar PGSD Undiksha*, 12(1), 185-194. <https://doi.org/10.23887/jjpgsd.v12i1.68763>
- Maghfiroh, S., & Suryana, D. (2021). Media pembelajaran untuk anak usia dini di pendidikan anak usia dini. *Jurnal Pendidikan Tambusai*, 5(1), 1560-1566.

- Manurung, P. (2020). Multimedia Interaktif Sebagai Media Pembelajaran Pada Masa Pandemi Covid 19. *Al-Fikru: Jurnal Ilmiah*, 14(1), 1-12. <https://doi.org/10.51672/alfikru.v14i1.33>
- Marpelin, N. K. S., Margunayasa, I. G., & Trisna, G. A. P. S. (2023). Interactive Multimedia Based on Project-Based Learning Model Using Articulate Storyline 3 Application on the Topic of the Human Digestive System. *International Journal of Elementary Education*, 7(3), 504-515. <https://doi.org/10.23887/ijee.v7i3.59645>
- Mulyati, M., Mashabi, N. A., Putri, A. E., Pramesti, A. C., & Suryani, S. (2024, February). The Effectiveness of Using Interactive Multimedia (Smart Apps Creator, Articulate Storyline, and E-Module) and Conventional in Bartending Courses. In *5th Vocational Education International Conference (VEIC-5 2023)* (pp. 742-748). Atlantis Press. https://doi.org/10.2991/978-2-38476-198-2_101
- Mustika, T. M., Sumarni, W., & Prasetya, A. T. (2025). The effectiveness of articulate storyline media containing ethnoscience in improving critical thinking skills of elementary school students. *International Journal of Research and Review*, 12(3): 251-262. <https://doi.org/10.52403/ijrr.20250332>
- Nissa, A. D. A., Toyib, M., Sutarni, S., Akip, E., Kadir, S., & Solikin, A. (2021). Development of learning media using android-based articulate storyline software for teaching algebra in junior high school. In *Journal of Physics: Conference Series* (Vol. 1720, No. 1, p. 012011). IOP Publishing. 10.1088/1742-6596/1720/1/012011
- Nurmala, S., Triwoelandari, R., & Fahri, M. (2021). Pengembangan media articulate storyline 3 pada pembelajaran IPA berbasis STEM untuk mengembangkan kreativitas siswa SD/MI. *Jurnal Basicedu*, 5(6). <https://doi.org/10.31004/basicedu.v5i6.1546>
- Rahayu, N., Mulyono, H., & Mary, T. (2023). Pengembangan media pembelajaran berbasis animasi menggunakan articulate storyline. *Jurnal Pendidikan Tambusai*, 7(1), 1764-1770.
- Ramadhani, N., Ulya, W. J., Nustradamus, S. B., Fakhriyah, F., & Ismaya, E. A. (2023). Sistematis literature review: peran media pembelajaran interaktif dan konvensional pada proses pembelajaran di sekolah dasar. *Student Scientific Creativity Journal*, 1(5), 99-114. <https://doi.org/10.55606/sscj-amik.v1i5.1931>
- Ratnaningsih, N. A. N. I., Husain, S. K. S., Patmawati, H. E. T. T. Y., Sukirwan, S., Hidayat, E. D. I., & Romdiani, N. S. R. I. (2024). Articulate Storyline 3 Based Interactive Media To Explore Mathematical Communication Ability: Development And Implementation. *Journal of Engineering Science and Technology*, 19(5), 1811-1830.
- Rayanto, Y. H., & Sugianti (2020). Penelitian Pengembangan Model ADDIE dan R2D2: Teori & Praktek. *Lembaga Academic & Research Institute*.
- Sari, E. N. (2024). Pengembangan Multimedia Interaktif Berbasis Articulate Storyline 3 Materi Majas Personifikasi Kelas IV SDN Wiroborang 4 Kota Probolinggo (*Doctoral dissertation, Universitas Panca Marga*).

<https://doi.org/10.31004/innovative.v4i2.9302>

- Sugiyono. (2023). *Metode Penelitian Kuantitatif, Kualitatif dan R&D*, Bandung: ALFABETA, cv.
- Suleman, M., Sugiyarto, K. H., & Ikhsan, J. (2019, December). Development of media three-dimensional (3D) visualization using virtual reality on chemistry education. In *Journal of Physics: Conference Series* (Vol. 1397, No. 1, p. 012034). IOP Publishing. 10.1088/1742-6596/1397/1/012034
- Susilo, B. E. (2023). *Pengembangan Media Pembelajaran Interaktif Berbasis Ispring Suite Pada Mata Pelajaran Matematika Materi Bangun Datar Kelas Iii Di SDN Mangunharjo 1 Kota Probolinggo* (Doctoral dissertation, Universitas Panca Marga). <http://repository.upm.ac.id/id/eprint/4247>
- Syafitri, N. F. (2024). Pengembangan Multimedia Interaktif Menggunakan Articulate Storyline Materi Tata Surya Kelas 6 SD. *Jurnal Pendidikan Dasar Dan Sosial Humaniora*, 3(3), 227-236.
- Syam, H. (2023). Development of Media and Learning Resources at Islamic Boarding Schools Facing Education in the Digital Era. *GIC Proceeding*, 1, 281-286. <https://doi.org/10.30983/gic.v1i1.62>
- Ulum, Q., Manoy, J. T., & Fiangga, S. (2024). Pengembangan Game Edukasi Berbasis Android dengan Articulate Storyline Pada Materi Sistem Koordinat. *MATHEdunesa*, 13(1), 16-41. <https://doi.org/10.26740/mathedunesa.v13n1.p16-41>
- Wahyuni, N., Meilisa, R., Imamudin, R. P., & Nandar, H. S. (2023). The effect of articulate storyline-based interactive learning media to facilitate student learning independence. *Journal of Computer-based Instructional Media*, 1(1), 25-33. <https://doi.org/10.58712/jcim.v1i1.18>
- Xuan, Y. & Della, C. (2024). Assessing the impact of interactive multimedia learning platforms on dance education outcomes. *International Journal of Advance and Applied Sciences*, 11(9), 7-16. <https://doi.org/10.21833/ijaas.2024.09.002>
- Zahratunnisa, M. D., Ismaya, E. A., & Hilyana, F. S. (2024). D Development of Articulate Storyline of Human Respiratory System Materials in V-Class Students at Pati. *Bulletin of Science Education*, 4(1), 159-169. <https://doi.org/10.51278/bse.v4i1.1107>
- Zubaedah, Z., Riswandi, R., Yulianti, D., & Firdaus, R. (2024). Development of Interactive Video Learning Media Based on Articulate Storyline to Improve Students Critical Thinking Skills in Thematic Learning Grade V Elementary School. *International Journal of Current Science Research and Review*, 7(3). <https://doi.org/10.47191/ijcsrr/V7-i3-49>