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Development of interactive multimedia on social studies learning outcomes of elementary school students

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ABSTRACT

The lack of interesting interactive learning media causes the low learning outcomes of social studies in primary schools. Monotonous learning methods make students less motivated and involved in the learning process. This study aims to develop and analyze the effectiveness of interactive multimedia based on Articulate Storyline 3 in improving learning outcomes. The method used is Research and development (RnD) with the 4-D development model (Define, Design, develop, disseminate). The research subjects were 25 students of class IV UPT SDN 064992. Data were collected through observation, interviews, expert validation questionnaires, and effectiveness tests using the N-gain method. The results showed that using Articulate Storyline 3 improved student learning outcomes with an N-gain of 0.39. Evaluations from teachers and students also show that this media is suitable for learning, but it still needs appearance and navigation improvement. In conclusion, Articulate Storyline 3 effectively improves social studies learning outcomes. Future research is recommended to develop adaptive features and gamification to increase student engagement in the learning process in the classroom.

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ABSTRAK

Rendahnya hasil belajar IPS di sekolah dasar disebabkan oleh kurangnya media pembelajaran interaktif yang menarik. Metode pembelajaran yang monoton membuat peserta didik kurang termotivasi dan terlibat dalam proses belajar. Penelitian ini bertujuan untuk mengembangkan dan menganalisis efektivitas multimedia interaktif berbasis Articulate Storyline 3 dalam meningkatkan hasil belajar. Metode yang digunakan adalah Research and Development (RnD) dengan model pengembangan 4-D (Define, Design, Develop, Disseminate). Subjek penelitian adalah 25 peserta didik kelas IV UPT SDN 064992. Data dikumpulkan melalui observasi, wawancara, angket validasi ahli, dan uji efektivitas menggunakan metode N-gain. Hasil penelitian menunjukkan bawah penggunaan Articulate Storyline 3 meningkatkan hasil belajar peserta didik dengan N-gain sebesar 0.39. Evaluasi dari guru dan peserta didik juga menunjukkan bahwa media ini layak digunakan dalam pembelajaran, meskipun masih perlu perbaikan pada tampilan dan navigasi. Kesimpulannya, Articulate Storyline 3 efektif dalam meningkatkan hasil belajar IPS. Penelitian selanjutnya disarankan untuk mengembangkan fitur adaptif dan gamifikasi guna meningkatkan keterlibatan peserta didik dalam proses pembelajaran di kelas.

Kata Kunci: *articulate storyline; IPS; media interaktif; sekolah dasar*

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INTRODUCTION

Classroom implementation in schools is generally carried out using the lecture method based on textbook theory as a reference. Not all educators can creatively carry out the learning process due to limited knowledge about the learning media used. Social studies learning in elementary schools is theoretical and does not involve students actively understanding the social context in everyday life. The use of media that is not interactive and has a less relevant approach will make the delivery of material boring and difficult for students to understand.

Efforts to improve the quality of education need to be continuously carried out. Improvements can be made by improving educators' teaching quality and students' abilities (Buddin & Wardani, 2023). The Indonesian government must continue to conduct evaluations to improve the quality of learning through curriculum improvements and the development of school facilities and infrastructure (Hasmirati et al., 2023). Consistent and coordinated efforts are needed to improve student learning outcomes in the future significantly.

Teachers at the elementary school play an important role in guiding children in managing their emotional and social aspects. Elementary education allows students to discover and develop their interests and potential (Asnawi et al., 2023). Teachers can use various facilities optimally, such as conducive classrooms, libraries, laboratories, and technological tools. Using these facilities plays a crucial role in creating a pleasant learning atmosphere while supporting the success of an effective teaching process for students.

Active learning in elementary schools must integrate students' cognitive, emotional, and physical development to build students' understanding of the learning material (Jegstad, 2023; Setiawan et al., 2024). It needs to be designed and implemented holistically to help students develop social skills, manage emotions, and strengthen their overall involvement in the learning process. Monotonous learning can affect students' learning outcomes, especially in elementary schools.

Table 1. Grade IV Social Studies Scores at UPT UPT SDN 064992

School year	Average Score	Percentage (%)
2022 - 2023	65	55%
2023 - 2024	68	55%

Source: Research 2024

Boredom makes students less attentive to the learning process (Derakhshan et al., 2022), which impacts low learning outcomes, one of the indicators that determine the quality of education, as shown in the data presented in **Table 1**. Differences in learning outcomes are also influenced by environmental factors around students (Isnaeni & Radia, 2021). **Table 1** contains students' learning outcomes at UPT UPT SDN 064992 during the 2022-2023 and 2023-2024 periods, illustrating no increase in student grades. Although there were improvements in learning methods, the percentage of student graduation did not increase significantly. Based on this, teaching methods that focus only on the role of teachers risk reducing or not improving the quality of student learning outcomes. This can also be influenced by students who are bored and not interested in the material presented, as well as the lack of teacher attention to the cognitive development of each student (Yulia & Suttrisno, 2024). On the other hand, using teaching methods that encourage active participation creates a more practical and valuable learning experience for students.

Based on the observations at UPT SDN 064992, teachers face challenges in creating interesting learning media. Presentations made using Microsoft PowerPoint and Canva tend to be monotonous because they

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only contain text without interactive elements, so students tend to get bored easily and become uninterested in the material presented. The lack of variation in elements and interactivity makes students' attention easily diverted (Fitria *et al*., 2024). Interactive elements in learning media are needed to attract students' attention (Rosyiddin et al., 2023). Technical explanations by teachers are often less practical in maintaining student involvement. Without interactive multimedia, the learning process feels flat, especially for students who are used to active methods. Therefore, innovation is needed to combine interactive elements to increase student interest (Fauziah *et al*., 2023).

One of the IPS learning materials is about the diversity and origins of religion, especially in this case, in Indonesia. Presenting a learning experience in the classroom about the history of Hindu, Buddhist, and Islamic kingdoms and their influence on the lives of today's society in the local area that is more interactive, contextual, and in-depth (Tahir & Tahir, 2024). The use of multimedia elements such as animation, video, and simulation can be interesting for students because they can explore historical events visually and interestingly, making it easier to understand past events and their relationship to current social, cultural, and economic conditions in the student's environment (Perkasa & Wantoro, 2024). There is a need to provide a more lively and in-depth learning experience regarding the history of Hindu, Buddhist, and Islamic kingdoms, and their impact on the lives of local communities today.

Jean Piaget was a Swiss developmental psychologist famous for his cognitive development theory. In “The Origins of Intelligence in Children,” Piaget explains that students' learning process occurs through sequential cognitive stages: sensorimotor, pre-operational, concrete operational, and formal operational. Piaget stated that the process of building knowledge through experience and environmental interaction is the definition of learning. Students receive information and actively construct their understanding (Suryana *et al*., 2022).

Lev Vygotsky is known for his sociocultural theory, which emphasizes the importance of social interaction in students' cognitive development. Vygotsky's main concepts are explained in the book “*Mind in Society: The Development of Higher Psychological Processes*” is the Zone of Proximal Development or Zero Proximal Development (ZPD), which is the distance between the actual ability of students to complete tasks independently and their potential abilities with the help of adults or more capable peers. Vygotsky believed that the learning process involves collaboration and communication, in the context of Zero Proximal Development (ZPD), individual students in completing more difficult tasks need the help of others (Suardipa, 2020). This learning must be presented in a more interactive way, relevant to the context, and digging deeper into the historical aspects that influence the conditions of modern society (Nurhasanah *et al*., 2023; Zamroni *et al*., 2024).

The use of multimedia elements such as animation, video, and simulation can be interesting for students because they can explore historical events visually and interestingly, making it easier to understand past events and their relationship to current social, cultural, and economic conditions in their environment so that it will contribute to the formation of a strong national identity and influence students' attitudes, behavior, and sense of pride towards the nation and the Unitary State of the Republic of Indonesia (Mas’ad *et al*., 2024).

The use of interactive multimedia technology through Articulate Storyline 3 can be an effective way to improve the quality of the learning process. This application was chosen because of its ability to present an engaging and interactive learning experience by integrating various components such as text, images, sound, video, and animation. Interactive multimedia based on Articulate Storyline 3 can be adjusted to the various learning preferences of each student, which ultimately increases the effectiveness of the learning process and learning outcomes (Husain & Ibrahim, 2021). Through the application of interactive multimedia based on Articulate Storyline 3, it is hoped that students can more easily understand the often

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complex concepts of social studies through image visualization and simulations that allow for direct interaction. In addition, this media also provides direct responses that allow students to correct their mistakes in real time (Nursalam *et al*., 2023; Rofiah *et al*., 2024).

Interactive features allow learners to actively explore maps, artifacts, and historical stories actively, encouraging greater curiosity and engagement. In addition, Articulate Storyline 3's ability to present locally-based materials ensures that learning is relevant to the local context, so that learners can connect historical heritage to their daily lives, strengthening their understanding of the nature of history as a shaper of modern society's identity (Aini, 2024; Manuain *et al*., 2024; Nurcahyanto *et al*., 2023).

This study aims to design an interactive learning aid that utilizes the Articulate Storyline 3 platform and assess the effect of using the aid on improving student learning performance. This study has three main focuses, namely 1) analyzing and exploring the stages of developing interactive multimedia based on Articulate Storyline 3; 2) assessing the feasibility of implementing the interactive multimedia; and 3) measuring how effective its use is in influencing student learning outcomes.

LITERATURE REVIEW

Ilmu Pengetahuan Sosial (IPS) Learning

Learning involves planned activities by educators to help students acquire desired knowledge and skills. This process involves personal reflection that shapes how a person understands the world and the new skills they develop. Learning includes a variety of strategies, methods, and materials used to support and guide students in achieving educational goals.

Deep conceptual understanding of the environment and gaining direct experience is the essence of social studies learning (Ilyas et al., 2024). Social Studies (IPS) subjects review various events, facts, ideas, and conclusions about social problems. Therefore, it is important for social studies learning at the elementary school level to teach students about various forms of interaction with their environment to develop adequate social skills in the future (Dewi & Agung, 2021). However, social studies learning in elementary schools encounters various obstacles and challenges, such as a lack of teachers who master the field of social studies teaching, limited learning resources, and learning facilities that are not considered by the government (Khotimah et al., 2024; Syawaluddin et al., 2020). Based on this, teachers' understanding of student learning materials is quite important to improve the quality of student learning.

The material in social studies learning is very diverse and has a broad scope. Social studies learning materials generally include anthropology, history, and geography (Nasution et al., 2022). Therefore, the author narrowed down the learning materials studied in this study based on needs. The materials used in this study are the Heritage of the Hindu, Buddhist, and Islamic Kingdoms. Social studies learning equips students with the skills and attitudes to face social challenges and actively create positive change in a diverse and dynamic society. The learning process also teaches students to appreciate cultural and social diversity in their environment and globally.

Learning Outcomes

Learning outcomes are the leading indicators of the effectiveness of the learning process, which refer to the abilities acquired by students after going through learning experiences. Social studies learning outcomes include students' abilities to collaborate with others and communicate effectively. The main goal

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of learning in the social studies discipline is to achieve significant changes in individual behavior or competence. This includes aspects of knowledge and involves the formation of attitudes and practical skills obtained during the learning activities (Setiawan & Helminsyah, 2023).

Learning outcomes are the main parameter in measuring the quality of education, which includes three main dimensions: cognitive, psychomotor, and affective (Luthfiah & Sartika, 2021). These learning outcomes are evaluated through various assessment methods, including written tests, projects, presentations, and observations of student behavior during learning. Teachers use student involvement, interaction between students, and students' ability to complete group assignments directly.

In Slavin's book entitled "*Educational Psychology: Theory and Practice,"* It is stated that Vygotsky emphasized the importance of social context in the learning process, so that learning is centered on students and increases students' motivation and learning outcomes. In the ZPD, there is a gap between a person's abilities and abilities that can be achieved with the guidance of others (Wardani *et al*., 2023). The most effective learning occurs when individuals interact with more experienced people. This interaction can be a teacher, friend, or family member who can provide support (Utaminingsih & Puspita, 2023). Through this assistance, students can develop new skills that were previously difficult to achieve alone.

When support is given, individuals feel more confident to face new challenges. This process also helps them understand deeper concepts. Through social interaction, individuals can internalize knowledge and skills (Hadiyanto *et al*., 2024). ZPD also shows that learning is a dynamic and collaborative process. In the theory presented by Vygotsky, education is expected to optimize the potential of each individual by understanding the role of social support. This leads to more effective and meaningful learning.

Piaget and Vygotsky's opinions gave birth to the constructivist learning theory, which emphasizes that learning is an active process that involves students in building knowledge. Piaget showed that students actively construct their understanding through experience and interaction with the environment. Piaget also explained that cognitive development occurs in different stages, each with a unique way of thinking (Tanaya, 2024). Social context and interaction with more experienced people are also considered important.

The concept of ZPD suggests that individuals can achieve new abilities with the help of others. Both agree that learning not only occurs personally, but is also influenced by social interaction. Constructivism, knowledge is built through exploration, collaboration, and communication (Wardani *et al*., 2023). Children learn more effectively when they are engaged in processes that are relevant to real-world experiences. This theory encourages educators to create learning environments that support exploration and interaction.

The cognitive aspect is related to the understanding and knowledge gained. Meanwhile, the affective aspect is related to the attitudes and values held by students (Ni'amah & M, 2021). On the other hand, the psychomotor aspect concerns physical skills acquired through practice (Noer et al., 2023). All these aspects are interrelated and support each other in the learning process.

Various factors influence learning outcomes in Social Sciences (IPS) lessons, including the quality of learning media and the teaching approach. These aspects need to be owned by students because they can affect learning outcomes. These various elements are expected to create more efficient learning methods and provide significant benefits in improving student learning achievement in the field of IPS. Therefore, teachers must continue innovating to improve student learning outcomes.

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Interactive Multimedia

Multimedia allows students to absorb information more enjoyably and effectively (Junpahira & Pahlevi, 2023). The use of various media aims to improve students' understanding and memory of the material (Noverdika, 2021). In addition, interactive multimedia plays a role in increasing student involvement and participation during the learning process. Using multimedia allows students to learn in various ways that can be adjusted to their preferences and needs. Learning involving interactive media is more fun and less monotonous, which helps increase students' interest and involvement. This helps them to be more enthusiastic and focused when studying social studies material.

The principle of constructivism prioritizes active participation of students (Nerita et al., 2023). In addition, constructivism highlights the importance of effective media design to support learning objectives. In this context, using videos, texts, images, and games can help students understand the material better (Lathifah, 2024). The use of interactive multimedia is beneficial in modern education. This shows that the development of multimedia can have a positive impact on students. Therefore, the principle of constructivism provides a strong foundation for this study. The integration of appropriate media can create a more effective learning environment.

Piaget stated that the process of individuals building knowledge through experience and interaction with the environment is the definition of learning (Babullah, 2022). This process involves exploration and experimentation, where learners try different ways to understand the world around them. Learners develop increasingly complex thinking skills. For example, at the sensorimotor stage, they learn through their senses and physical actions (Tanaya, 2024). While in the pre-operational stage, students are directed to start using symbols and language, although their thinking is still egocentric. In the concrete stage, they can think logically about real objects but struggle with abstract concepts. While in the formal stage, they can think abstractly and hypothetically (Marinda, 2020).

Articulate Storyline 3

Articulate Storyline 3 is a popular software for creating online learning content. This application can produce interactive and engaging learning modules. Transparent and interactive visualizations make it easier for students to understand and remember the material. Articulate Storyline 3 also facilitates student engagement through direct interaction with the material.

Articulate Storyline 3 has several page views, including the application's initial display page, work page, new menu options, and character page views, as shown in **Figure 1**. Articulate Storyline 3 helps create a more dynamic and interactive learning experience, supporting modern education and professional training needs.

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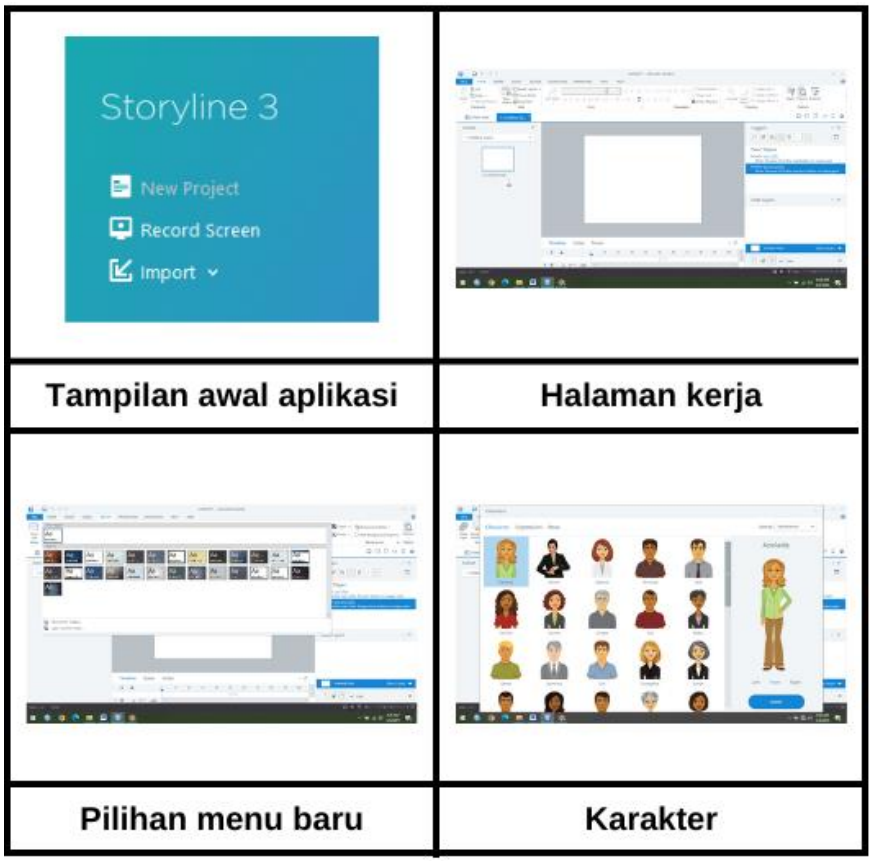

Figure 1. *Articulate Storyline 3 Dashboard*
Source: Research 2025

Users are expected to be able to take advantage of the advantages of the Articulate Storyline 3 software. Although there are shortcomings, this software still has many features that can be used as interactive learning media. Users can maximize the available features to produce the desired learning media according to their needs.

METHODS

This research uses a Research and Development (R&D) approach that refers to the 4-D development model. In the book "*Metodologi Penelitian Pendidikan"* by Sani, it is stated that the implementation of the development process consists of, 1) Define stage, where analysis is carried out on the needs and characteristics of students to ensure that the product developed is appropriate and provides benefits; 2) Design stage, where learning media is arranged by considering the comfort and preferences of students, so that the material presented can be received in an engaging and easy-to-understand way; 3) Develop stage, involving the creation and testing of prototypes to ensure that the product functions well and effectively; and 4) Disseminate stage, at this stage ensures that interactive multimedia is distributed and applied appropriately in the educational environment.

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Figure 2. 4-D Model Development Stages
Source: Sani in the book Buku "Metode Penelitian Pendidikan"

The study population was 25 fourth-grade students of UPT SDN 064992, Medan Amplas District. This study not only focused on students as the main party, but also involved two teachers to gain insight from a pedagogical perspective, an expert in learning design, a linguist, and a specialist in learning media. An approach involving various disciplines is expected to provide a more comprehensive perspective on developing interactive multimedia by utilizing Articulate Storyline 3 as the leading platform.

Data collection was carried out using several methods, including:

1. Evaluation by experts to assess the feasibility of using interactive multimedia developed with Articulate Storyline 3;
2. Observation to gain insight into how the multimedia is applied in practice and identify aspects that may need to be improved;
3. Interviews to dig deeper into the material being taught, how students view multimedia, and obtain unstructured input that may not be revealed in observations;
4. The overall evaluation aims to determine whether interactive multimedia can positively impact student learning outcomes and assess the extent to which students understand the material studied.

A quantitative approach is used, using the N-gain test to measure the differences in student learning outcomes before and after using interactive multimedia developed using Articulate Storyline 3.

RESULTS AND DISCUSSION

Defining Phase

The main problem in learning social studies in class IV UPT SDN 064992 is the limited use of interactive learning media. The available media only includes reading books and static slides, which are less interesting for students. As a result, student motivation in participating in learning is low, which leads to less than optimal learning outcomes. Over the past two years, the average score of class IV students at UPT SDN 064992 has slightly increased, from 65 in the 2022-2023 academic year to 68 in the 2023-2024 academic year. However, despite this increase, the percentage of students failing remains at 55%.

Piaget and Vygotsky's constructivist theory can analyze the characteristics of learners who prefer learning media that integrate visual, interactive, competitive, and collaborative elements. Their theories underlie the development of interactive multimedia. Piaget emphasizes the construction of knowledge through interaction with the environment, while Vygotsky highlights the role of social interaction in learning.

After analyzing the needs, the next stage is to analyze the students. The character of students who like visual, interactive, and collaborative media aligns with Piaget and Vygotsky's constructivist theory, where understanding is built through interaction and concrete experiences. Therefore, learning media designed with these elements can encourage active student involvement, improving overall learning outcomes.

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Learning objectives are formulated in the formulation process using an approach based on the constructivist theory proposed by Piaget and Vygotsky. This approach emphasizes the crucial role of social interaction and learning experiences in the learner's Zone of Proximal Development (ZPD). According to Piaget, learning occurs through a continuous cognitive development process. At the same time, Vygotsky highlights support from the learning environment to help learners achieve their potential in completing more complex tasks.

Designing Phase

Articulate Storyline 3 was chosen as the primary platform in designing interactive learning experiences for social studies subjects, especially those related to the heritage of the Hindu, Buddhist, and Islamic Kingdoms. This tool combines various multimedia elements, including text, images, audio, and video. The integration feature of these formats, Articulate Storyline 3, is effective in delivering material and can present a more interactive and engaging learning experience for students.

The things that were developed in the design of the development of learning media using Articulate Storyline 3 include the selection of the use of learning media that integrate interactive multimedia in science lessons, especially in social studies material that includes the topic of the legacy of the Hindu, Buddhist and Islamic kingdoms, driven by the needs of students to learn the material in a more interesting, participatory and efficient way.

Development is also done by inputting images. The image format is chosen to present visualizations of relics in the form of temples, inscriptions, mosques, or crafts that reflect past cultures. Images provide visual appeal that helps students understand the form and function of these relics.

Videos are also added to the development of learning media design. Videos display structured historical narratives, such as the process of building a temple or the spread of religion, so that students get a dynamic and in-depth picture of the topic. In addition, sound in the form of narration or audio effects supports image and video elements, which are also added to create a more immersive learning experience. Sound also aims to provide a variety of stimuli so that students are more focused and understand the material through various information channels. **Figure 3** shows the design of learning media designed using Articulate Storyline 3.

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Figure 3. Articulate Storyline 3 Development View
Source: Research 2025

Development Phase

The interactive multimedia development process using Articulate Storyline 3 is structured, involving assessments from various experts, including media, language, and learning design experts. The purpose of this process is to ensure that the resulting learning materials not only meet the applicable quality criteria but can also be adapted to the needs and characteristics of students, are easy to understand, visually appealing, and have a strong connection to the learning context. This validation process involving various perspectives ensures that the learning media can be applied effectively in supporting learning activities in the classroom.

This product is designed to be compatible with handheld devices such as tablets and smartphones, based on the principle of flexible learning. This ease of access provides opportunities for students to gain learning not only in the school environment, but also at home, which in turn expands the opportunities and space for them to learn. This supports a constructivist approach where students control their learning process, allowing for independent exploration and reflection. Utilizing interactive multimedia technology based on contemporary educational principles, it is hoped that this product can deepen students' understanding of social studies material, train them in analytical thinking skills, and solve problems effectively.

The interactive multimedia created is then tested for the feasibility of the material, media, and use. Interactive multimedia based on Articulate Storyline 3 is tested for feasibility by four experts, consisting of lecturers and teachers as education practitioners, to assess whether interactive multimedia based on Articulate Storyline 3 is feasible. The validation results are used to improve interactive multimedia based on Articulate Storyline 3 so that it can be assessed accurately. Interactive multimedia based on Articulate Storyline 3 is then revised based on input from expert respondents to produce a better product.

The results of expert validation of the feasibility instrument in Table 2 show an in-depth assessment of three main domains: media construction, multimedia acceptability, and content/material. Each domain includes various aspects of assessment designed to ensure the quality and effectiveness of the developed

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learning media. Media Construction is assessed based on visual design, element integration, and ease of use. Multimedia Acceptability is evaluated in attractiveness, interactivity, and relevance to learner needs. The content/material domain includes an assessment of the accuracy of information, suitability to the curriculum, and clarity of delivery.

Table 2. Feasibility Results from Expert Validation

No	Domain	Aspects	Statement items (n)	Total Score (∑x)	Total Score
1	Media Construction	• Information guide • Program performance • Systematics, aesthetics, and design principles.	38	128	3.36 Feasible
2	Multimedia Acceptance	• Guides and information • Multimedia materials • Evaluation • Media design and facilities	31	145	4.67 Very Feasible
3	Contents	• Guides and information • Multimedia content/materials • Evaluation	24	90	3.75 Feasible

Source: Research 2025

In general, the three aspects' evaluation results listed in Table 2 indicate that the designed learning media have met fairly good quality standards. Media construction and content/material aspects are included in the "adequate" category, while multimedia acceptance is included in the "very adequate" category. Thus, this learning media can be considered ready to be used as a tool in the educational process. Sriadhi, in his book “Instrumen Penilaian Multimedia Media Pembelajaran”, the validation method used is the approach in which the average value of the scores for each domain is used to determine the eligibility level.

Dissemination Phase

The field trial was implemented in class IV UPT SDN 064992 Medan Amplas District by involving class IV students as participants. The total number of participants was 25 students who were involved in using multimedia as part of the learning activities. Multimedia was used independently or in groups to accommodate learning needs and the limitations of the available devices. Independent learning activities were carried out at each student's home, while group activities were at school.

The results of the evaluation questionnaire of the practicality of learning media by two teachers (Teacher I and Teacher II) cover aspects of guidance and information, appearance, and the program. In the Guidance and Information aspect, there are 10 sub-aspects such as the ability of the media to motivate students, the relevance of the material, and the visual quality of the media, each of which received the same score, namely 93.33, indicating an agreement between the two teachers regarding the quality of the media guidance and information. The scores in Table 3 reflect that the appearance and program of the media are good, but there is still room for improvement to meet expectations better.

Table 3. Practicality Questionnaire of Learning Media by Teachers

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Aspects	No	Assessment Aspects	Teacher I	Teacher II
Panduan dan Informasi	1	The ability of the media to motivate students	3	4
	2	Relevance of material to media	3	4
	3	Clarity of historical information	3	4
	4	Content alignment with the curriculum	4	4
	5	Visual quality of media	4	4
	6	Student engagement with media	4	4
	7	Effectiveness of media in delivering material	4	3
	8	Ease of use of media by students	4	3
	9	Accuracy of historical information in the media	4	3
	10	The influence of media on learning outcomes	4	4
Appearance and Programs	1	Students' ability to understand media	4	4
	2	Clarity of information in the media	3	4
	3	Ease of media navigation	4	3
	4	Quality of teacher response to media	4	4
	5	Media suitability with teacher expectations	4	4
		Total	$\frac{56}{60} \times 100 = 93..33$	$\frac{56}{60} \times 100 = 93..33$
		Categories	Very Feasible	Very Feasible

Source: Research 2025

Based on Table 3, the media is considered effective in delivering guidance and information, but the display and program aspects require further development to improve the quality of its use. The interactive multimedia learning process based on Articulate Storyline 3 went well and attracted students' attention. Students showed high enthusiasm in using laptops as learning media.

The n-gain method is used to measure the improvement in student learning outcomes after using media. The n-gain formula helps identify the extent of changes in students, individually and overall. This calculation strengthens the argument that interactive multimedia based on Articulate Storyline 3 has a significant influence.

$$N - Gain = \frac{Postest - Pretest}{Maximum\ Score - Pretest}$$

$$= \frac{72{,}76 - 55{,}20}{100 - 55{,}20}$$

$$= \frac{17{,}56}{44{,}8}$$

$$= 0{,}39$$

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The results of the analysis show that the n-gain value obtained is 0.39. This value is obtained from the difference between the average pretest and posttest scores. The number 0.39 is calculated using the n-gain formula, per this study's approach. This calculation illustrates the changes that occur after the intervention with an n-gain of 0.39; it can be seen that there is an increase in student learning outcomes. This value illustrates the level of difference between the initial and final results. This n-gain calculation is carried out to ensure that the data obtained is more measurable. The value of 0.39 is a reference in analyzing research results quantitatively. This number provides numerical information about the results of this study. The n-gain value is used as an indicator to conclude the study.

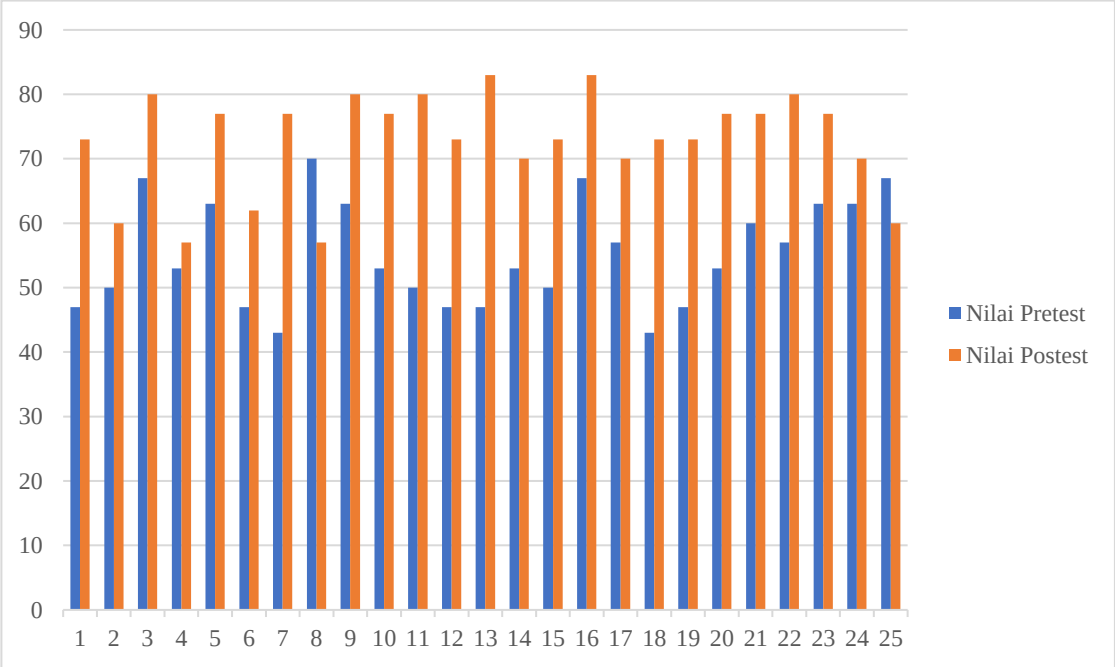

Figure 4. Comparison of Pretest and Posttest Values
Source: Research 2025

Based on the analyzed **Figure 4**, there is a pattern of increase, although there are some decreases in individual results. However, if we look at the average value of students in grade IV of SDN 064992, there was a significant increase from 55.20 to 72.76 in the posttest. This increase indicates a positive impact on the effectiveness of interactive multimedia. The observed average increase provides an initial indication that the media developed has the potential to boost student learning achievement. This study's findings align with the objectives to be achieved, namely to assess the extent to which the media is effective, which is measured using the n-gain calculation. The n-gain technique is used to evaluate the extent of progress students achieve after applying the media in the learning process. The n-gain formula helps identify the extent of changes in students, individually and as a whole. This calculation strengthens the argument that interactive multimedia based on Articulate Storyline 3 has a significant influence.

Discussion

This development also aligns with Piaget and Vygotsky's constructivist theory, which emphasizes experiential learning and social interaction. Through Articulate Storyline 3, students can learn independently but still get the proper support, according to the Zone of Proximal Development (Sayidi, 2023). Articulate Storyline 3 offers features that allow the integration of various media formats, including text, images, audio, and video, which support direct communication between students and learning materials. The learning format is adjusted to the level of student ability; this media increases effectiveness

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and engagement in understanding historical materials of the kingdom's heritage (Budyastuti & Fauziati, 2021). Increasingly developing immersive technology makes learning more effective and innovative (Hasannah *et al*., 2024).

The selection of interactive multimedia-based media formats is based on students' needs to learn the material in an interesting and effective way (Baharuddin et al., 2024; Ginting et al., 2021). Images are used to visualize historical relics such as temples, inscriptions, mosques, and crafts, which help students understand the form and function of these relics. Videos provide a more dynamic narrative on historical topics, such as the process of building temples or the spread of religion.

This learning media prototype is designed to run smoothly on portable devices such as tablets and smartphones, providing convenience in the learning process that can be done anywhere and anytime, both at school and home. This view aligns with the statement that the ability to access learning flexibly in various locations can positively impact student learning outcomes (Suharsono & Handayani, 2022).

Piaget emphasized direct experience in constructing knowledge, where learners learn through interaction with their environment and actively solving problems (Rohaendi & Laelasari, 2020; Telaumbanua & Siahaan, 2022). Teachers gave questionnaires to evaluate the practicality of the media, which showed that the media was effective in delivering the material, but needed further development in terms of appearance and navigation. In addition, applying the n-gain method also showed positive changes in learning outcomes, although there were some variations in individual changes. This evaluation shows that technology integration can improve the quality of education and positively impact interactions between students.

CONCLUSION

This study shows that using interactive multimedia based on Articulate Storyline 3 in social studies learning at the elementary school level has a positive impact on improving student learning outcomes. Based on the effectiveness test with N-gain calculations, a value of 0.39 was obtained, indicating increased student learning outcomes after using interactive multimedia. In addition, the results of expert validation on aspects of media construction, multimedia acceptability, and content feasibility indicate that the developed media is suitable for use in learning.

Although this study has shown the effectiveness of using interactive multimedia in social studies learning, several aspects can still be developed further. One of them is integrating gamification-based learning features into Articulate Storyline 3, such as a point system, challenges, and leaderboards, to increase student motivation and engagement. Further research can examine the impact of using interactive multimedia on critical thinking skills and student creativity, which are important aspects in 21st century education.

AUTHOR'S NOTE

The author declares that there is no conflict of interest regarding the publication of this article and confirms that the data and content of the article are free from plagiarism.

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REFERENCES

Aini, R. P. (2024). Menelusuri media pembelajaran: Solusi kreatif untuk pembelajaran IPA di sekolah dasar. *Jurnal Madinasika Manajemen Pendidikan dan Keguruan, 5(*2), 48-57.

Asnawi, A., Rakhmat, C., & Sidik, G. S. (2023). Peran guru dalam menemukan dan mengembangkan potensi kecerdasan peserta didik di sekolah dasar. *Jurnal Educatio FKIP UNMA, 9*(2), 1089-1099..

Babullah, R. (2022). Teori perkembangan kognitif Jean Piaget dan penerapannya dalam pembelajaran. *Epistemic: Jurnal Ilmiah Pendidikan, 1*(2), 131-152.

Baharuddin, N. I., Nurhikmah, H., & Lu'mu, L. (2024). Interactive multimedia development for science education in class IX at SMPN 2 Galesong Utara. *Inovasi Kurikulum, 21*(2), 699-722.

Buddin, S., & Wardani, N. S. (2023). Upaya peningkatan hasil belajar tematik melalui discovery learning siswa kelas 3 Sekolah Dasar Negeri 01 Rejosari Temanggung. *Kalam Cendekia: Jurnal Ilmiah Kependidikan, 11*(3), 802-809.

Budyastuti, Y., & Fauziati, E. (2021). Penerapan teori konstruktivisme pada pembelajaran daring interaktif. *Jurnal Papeda: Jurnal Publikasi Pendidikan Dasar, 3*(2), 112-119.

Derakhshan, A., Kruk, M., Mehdizadeh, M., & Pawlak, M. (2022). Activity-induced boredom in online EFL classes. *ELT Journal, 76*(1), 58-68.

Dewi, N. K. R., & Agung, A. A. G. (2021). The feasibility of social science learning e-book contains balinese local wisdom for elementary School. *International Journal of Elementary Education, 5*(1), 39-47.

Fauziah, I. N. N., Saputri, S. A., & Rustini, T. (2023). Penggunaan media audio visual dalam meningkatkan hasil belajar pada pelajaran ilmu pengetahuan sosial siswa sekolah dasar. *Dirasah : Jurnal Studi Ilmu dan Manajemen Pendidikan Islam, 6*(1), 125-135.

Fitria, N. D., Khamdun, K., & Bakhruddin, A. (2024). Pengaruh permainan rangking satu berbantuan PowerPoint interaktif terhadap hasil belajar IPAS di kelas IV SD*. Jurnal Riset Madrasah Ibtidaiyah (JURMIA), 4*(2), 146-158.

Ginting, D. A., Sudarma, I. K., & Sukmana, A. I. W. I. Y. (2021). Multimedia interaktif berbasis pendekatan kontekstual pada pembelajaran tematik untuk siswa kelas III sekolah dasar. *Indonesian Journal of Instruction, 2*(3), 133-143.

Hadiyanto, O., Pelupessy, P. J., Soumokil, T., & Leiwakabessy, J. E. M. (2024). Dinamika interaksi sosial dalam pembelajaran di MTSS Al Madinah kecamatan Sirimau kota Ambon. *Jurnal Darma Agung, 32*(4), 49-59.

Hasannah, N., Afina, A. F., Nuraeni, P., & Hadiapurwa, A. (2024). Is education possible in the metaverse especially in Indonesia?. *Hipkin Journal of Educational Research, 1*(1), 13-24.

Hasmirati, H., SY, N., Mustapa, M., Dermawan, H., & Hita, I. P. A. D. (2023). Motivation and interest: does it have an influence on pjok learning outcomes in elementary school children?. *Journal on Research and Review of Educational Innovation, 1*(2), 70-78.

Husain, R., & Ibrahim, D. (2021). Pengembangan media pembelajaran interaktif menggunakan Articulate Storyline di sekolah dasar. *Aksara: Jurnal Ilmu Pendidikan Nonformal, 7*(3), 1365-1374.

Ilyas, M., Fitriani, A., & Syam, H. (2024). Penerapan model pembelajaran kooperatif tipe think pair share untuk meningkatkan hasil belajar IPS sekolah dasar. *Jurnal Ilmiah Pena, 16*(1), 53-57.

https://doi.org/10.17509/jik.v22i2.80209

Isnaeni, R., & Radia, E. H. (2021). Meta-analisis pengaruh penggunaan media audio visual terhadap hasil belajar IPS siswa di sekolah dasar. *Edukatif : Jurnal Ilmu Pendidikan, 3*(2), 304-313.

Jegstad, K. M. (2023). Inquiry-based chemistry education: A systematic review. *Studies in Science Education, 60*(2), 251-313.

Junpahira, S. V., & Pahlevi, T. (2023). Pengaruh penggunaan multimedia interaktif Articulate Storyline 3 berbasis problem based learning terhadap hasil belajar siswa kelas XI MP di SMK Nurul Islam Gresik. *Jurnal Dimensi Pendidikan dan Pembelajaran, 11*(2), 149-171.

Khotimah, K., Nusantara, T., & Mashfufah, A. (2024). Tantangan membelajarkan materi Ilmu Pengetahuan Sosial (IPS) di sekolah dasar: Systematic Literature Review (SLR). *Sekolah Dasar: Kajian Teori dan Praktik Pendidikan, 33*(1), 73-81.

Lathifah, A. S. (2024). Pemanfaatan teknologi digital dalam pembelajaran konstruktivisme: Meningkatkan kualitas pendidikan di era digital. *Jurnal Pendidikan dan Kebudayaan (Jurdikbud), 4*(1), 69-76.

Luthfiah, Q., & Sartika, D. (2021). Metode pembelajaran karya wisata Candi Muaro Jambi: Pengaruh hasil belajar peserta didik pada muatan pembelajaran IPS di sekolah dasar. *Journal of Basic Education Research, 2*(3), 70-74.

Manuain, Y., Istiq'faroh, N., & Sukartiningsih, W. (2024). Analisis kebutuhan pengembangan media pembelajaran. *Jurnal Ilmiah Pendidikan Dasar, 9*(4), 2548-6950.

Marinda, L. (2020). Teori perkembangan kognitif jean piaget dan problematikanya pada anak usia sekolah dasar. *An-Nisa': Jurnal Kajian Perempuan dan Keislaman, 13*(1), 116-152.

Mas'ad, Arif, Syafril, & Munandar, A. (2024). Hubungan antara pemahaman konsep sejarah dengan pembentukan identitas nasional siswa sekolah dasar. *Ibtida'iy: Jurnal Prodi PGMI, 9*(2), 25-36.

Nasution, E. M., Suci, F. P., Rafiq, M. Penerapan ruang lingkup pembelajaran IPS di sekolah dasar. *Pema: Jurnal Pendidikan dan Pengabdian kepada Masyarakat, 2*(3), 188-193.

Nerita, S., Ananda, A., & Mukhaiyar, M. (2023). Pemikiran konstruktivisme dan implementasinya dalam pembelajaran. *Jurnal Education and Development, 11*(2), 292-297.

Ni'amah, K., & M, H. S. (2021). Teori pembelajaran kognivistik dan aplikasinya dalam pendidikan Islam. *Jurnal Ilmiah Mahasiswa Raushan Fikr, 10*(2), 204-217.

Noer, R. Z., Mustopa, D., Ramly, R. A., Nursalim, M., & Arianto, F. (2023). Landasan filosofis dan analisis teori belajar dalam implementasi kurikulum merdeka di sekolah dasar. *Jurnal Elementaria Edukasia, 6*(4), 1559-1569.

Noverdika, Y. (2021). Pengaruh penggunaan multimedia interaktif model tutorial dalam pembelajaran teknologi informasi dan komunikasi terhadap hasil belajar siswa kelas VIII SMPN 17 Padang. *Jurnal Literasiologi, 5*(1), 105-122.

Nurcahyanto, G., Djumadi, D., Hariyatmi, H., Agustina, P., Sidiq, Y., Kusumadani, A. I., Ismiyanto, M., & Ripdiyanti, A. D. (2023). Pelatihan pengembangan multimedia pembelajaran interaktif di SMP mutu menggunakan Articulate Storyline. *Sasambo: Jurnal Abdimas (Journal of Community Service), 5*(1), 102-114.

Nurhasanah, A., Azima, N. S., & Rustini, T. (2023). Urgensi pemahaman makna proklamasi untuk siswa sekolah dasar dalam kehidupan sehari-hari. *Sinar Dunia: Jurnal Riset Sosial Humaniora dan Ilmu Pendidikan, 3*(1), 32-41.

https://doi.org/10.17509/jik.v22i2.80209

Nursalam, N., Muhajir, M., Wibowo, S. A., & Suardi, S. (2023). The effectiveness of articulate storyline 3 application-based interactive learning media in social studies learning for elementary school. *Al-Ishlah: Jurnal Pendidikan, 15*(4), 5724-5732.

Perkasa, R. A. E., & Wantoro, J. (2024). Game edukasi interaktif sejarah kerajaan Hindu-Buddha menggunakan platform Scratch. *Edumatic: Jurnal Pendidikan Informatika, 8*(1), 36-45.

Rofiah, N. H., Sinta, T. N. A., & Dewi, R. (2024). Development of articulate storyline media for enhancing learning outcomes in natural and social sciences among elementary school students. *Al-Bidayah: Jurnal Pendidikan Dasar Islam, 16*(1), 19-40.

Rohaendi, S., & Laelasari, N. I. (2020). Penerapan teori Piaget dan Vygotsky ruang lingkup bilangan dan aljabar pada siswa MTS Plus Karangwangi. *Prisma, 9*(1), 65-76.

Rosyiddin, A. A. Z., Fiqih, A., Hadiapurwa, A., Nugraha, H., & Komara, D. A. (2023). The effect of interactive PowerPoint media design on student learning interests. *Edcomtech: Jurnal Kajian Teknologi Pendidikan, 8*(1), 12-24.

Sayidi, S. S. (2023). Analisis kebutuhan penggunaan media pembelajaran berbasis IT pelajaran IPA kelas VI SD. *Magistra: Media Pengembangan Ilmu Pendidikan Dasar dan Keislaman, 14*(1), 69-80.

Setiawan, D., & Helminsyah, H. (2023). Influence of citizen project learning model toward the students grade VII learning style and outcome of Gajah Mada Private Junior High School Medan. *Jurnal Ilmiah Teunuleh, 4*(4), 245-252.

Setiawan, M. A., Sriadhi, S., & Silaban, S. (2024). Enhancing critical thinking skill by implementing electronic student worksheets based on guided inquiry in natural science subject for elementary school. *Jurnal Pendidikan Kimia, 16*(3), 225-229.

Suardipa, I. P. (2020). Proses Scaffolding pada Zone of Proximal Development (ZPD) dalam pembelajaran. *Widyacarya: Jurnal Pendidikan, Agama & Budaya, 4*(1), 79-92.

Suharsono, S., & Handayani, S. (2022). Peningkatan motivasi belajar siswa melalui LKPD interaktif berbasis liveworksheets dalam pembelajaran online. *Inteligensi: Jurnal Ilmu Pendidikan, 4*(2), 121-126.

Suryana, E., Aprina, M. P., & Harto, K. (2022). Teori konstruktivistik dan implikasinya dalam pembelajaran. *JIIP - Jurnal Ilmiah Ilmu Pendidikan, 5*(7), 2070-2080.

Syawaluddin, A., Sidrah, A. R., & Khaerunnisa. (2020). Developing snake ladder game learning media to increase students' interest and learning outcomes on social studies in elementary school. *Simulation & Gaming, 51*(4), 432-442.

Tahir, A., & Tahir, M. (2024). Inovasi pembelajaran cerita anak: pengembangan e-komik interaktif berbasis multimedia. *Edumatic: Jurnal Pendidikan Informatika, 8*(2), 605-614.

Tanaya, H. T. (2024). Interactive e-book in problem-based history learning to enhance students' knowledge of the fall of the dutch east indies. *Indonesian Journal of History Education, 9*(2), 155-176.

Telaumbanua, I. S., & Siahaan, M. (2022). Penerapan model pembelajaran konstruktivisme bagi pembelajaran PAK anak usia 8 sampai 10 tahun dengan menggunakan media online. *Jurnal Dinamika Pendidikan, 15*(2), 90-100.

Utaminingsih, E. S., & Puspita, M. A. (2023). Emotional intelligence and its important role. *Jurnal Ilmiah*

https://doi.org/10.17509/jik.v22i2.80209

Profesi Pendidikan, 8(4), 2003-2011.

Wardani, I. R. W., Zuani, M. I. P., & Kholis, N. (2023). Teori belajar perkembangan kognitiv Lev Vygotsky dan implikasinya dalam pembelajaran. *Dimar: Jurnal Pendidikan Islam, 4*(2), 332-346.

Yulia, N. M., & Suttrisno. (2024). Developing local wisdom-based augmented reality modules for science and social studies learning in elementary schools. *Al-Ishlah: Jurnal Pendidikan, 16*(4), 5550-5560.

Zamroni, A. D. K., Zakiah, L., Amelia, C. R., Shaliha, H. A., & Jaya, I. (2024). Analisis pengaruh implementasi pendidikan multikultural terhadap sikap toleransi keberagaman siswa sekolah dasar inklusi. *Jurnal Ilmiah Profesi Pendidikan, 9*(2), 1112-1119.

https://doi.org/10.17509/jik.v22i2.80209