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Feasibility Test of Articulate Storyline 3 Learning Media Based on Local Wisdom for Optimizing Students' Algebraic Thinking Skills

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Abstract: This research focuses on assessing the suitability of learning media developed using Articulate Storyline 3. The foundation of local wisdom is integrated into the media to enhance algebraic thinking skills among students. The study analyzes the learning media's design, content, and effectiveness, emphasizing its potential to optimize algebraic thinking. The research employs a comprehensive evaluation, incorporating expert validation, small-scale testing, and field trials. Thirty-seven students were involved as research participants, with seven individuals for the pilot and 30 for the field scale tests. Meanwhile, five experts were employed to validate the designed instructional media. The instrument used to assess the feasibility of the instructional media was a questionnaire consisting of 32 items for student responses and 36 items for expert validators, with 17 points allocated to media experts and 19 to mathematics experts. The results demonstrate a high feasibility rating of 93,38%, indicating the efficacy of the Articulate Storyline 3-based learning media. Furthermore, students responded positively to the media, with an overall interest rating of 88,39%. The research also reveals a moderate increase in algebraic thinking skills, as reflected in the average n-gain index of 0,46 for small-scale testing and 0,39 for field-scale testing. The recommendations for future research include considerations for using free hosting to ease accessibility, enhancing interactivity in the presentation of teaching materials, and expanding the learning media to encompass diverse subjects aligned with students' needs. This study contributes valuable insights into developing and assessing technology-based learning tools, emphasizing their potential to optimize algebraic thinking skills among students.

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INTRODUCTION

One of the thinking abilities that become the focus of development in mathematics learning is algebraic thinking. Algebraic thinking, in its essence, is the cognitive process of understanding, applying, and manipulating mathematical concepts, involving the ability to recognize patterns, formulate mathematical relationships, and use mathematical symbols both in representing and solving problems (Sibgatulin et al., 2022; Pitta-Pantazi et al., 2020; Harti & Agoestanto, 2019). Algebraic thinking is a core foundation in solving mathematical problems and is crucial in enhancing logical and analytical skills. These two aspects are closely related, as logical and analytical skills aid in detailing problem-solving steps and bridging the mathematical concepts used (Chimoni et al., 2023; Medová et al., 2020; Eriksson & Eriksson, 2021). Furthermore, algebraic thinking can stimulate the development of creative thinking by exploring mathematical concepts and encouraging open-ended questions for problem-solving (Suherman & Vidákovich, 2022; Singh & Azman, 2023). Moreover, algebraic thinking is developed and empowered early on as preparation for understanding learning concepts in higher education (Carraher & Schliemann, 2020; Pourdavood et al., 2020). Thus, the urgency of algebraic thinking is not limited to the academic aspect but also positively impacts the formation of cognitive skills and the application of

mathematical concepts in various life contexts.

In practical classroom settings, students often face various challenges and problems related to algebraic thinking skills. Some common field conditions or problems faced by students regarding algebraic thinking skills include (1) abstract nature of algebraic concepts, which differs from a more concrete understanding of mathematical concepts, making it challenging for students to internalize algebraic ideas due to involving higher-order thinking (Ashraf, 2020; Miller, 2019); (2) understanding mathematical symbols such as variables, equation symbols, and algebraic operations hindering students from grasping the meaning and function of these symbols in an algebraic context (Chan et al., 2022; Turşucu, Spandaw, & de Vries, 2020); (3) the process of translating situations into algebraic forms as a challenge for students in formulating mathematical equations from real-world problems (Bora & Ahmed, 2019; Assadi & Hibi, 2022); and (4) simplification, factorization, or finding variable values posing constraints for students in applying concepts contextually (Nnadozie & Okoye-Ogbalu, 2023; Zuccarini & Malgieri, 2022). Therefore, overcoming these challenges requires a learning approach that focuses on conceptual understanding, contextual application, and teaching strategies that support the development of students' algebraic thinking skills.

Digital learning approaches using Articulate Storylines based on local wisdom contexts can be an innovative solution to stimulate and optimize students' algebraic thinking skills. Using Articulate Storylines in mathematical learning contexts, especially algebra opens up new opportunities to enhance student engagement and understanding through interactive elements, simulations, and visualizations (Hadza et al., 2020; Zhang et al., 2023). Articulate Storyline can integrate interactive simulations, allowing students to participate directly in the algebra learning process, such as interacting with variables, changing values, and observing their impact on equations or algebraic expressions (Daryanes et al., 2023; Engelbrecht et al., 2020). Moreover, an Articulate Storyline enables the creation of dynamic visualizations, such as animated graphs, interactive diagrams, or other graphical representations, aiding students in understanding abstract concepts more visibly. In practice, Articulate Storyline allows the customization of learning by providing modules or scenarios accessible according to individual proficiency levels (Lukkarinen et al., 2021; Martin & Betrus, 2019). This helps each student learn according to their needs and understanding levels. Additionally, the development of an Articulate Storyline can be tailored to local wisdom contexts, providing more meaningful and relevant learning for students (Fadli, 2020; Rapanta et al., 2020). This local wisdom context brings algebraic principles into concrete situations reflecting everyday life known to students, thus stimulating problem-solving processes and critical thinking (Connoly & Cosgrove, 2022; Even, Krainer, & Huang, 2020). The digital learning approach using Articulate Storyline with local wisdom contexts offers a dynamic and responsive approach to students' learning needs in the algebra context.

Research on learning media development using Articulate Storyline has grown in Indonesia over the last five years. Sindu, Santyadiputra, and Permana (2020) implemented an Articulate Storyline to assess its effectiveness in developing students' cognitive abilities, particularly in the primary computer science subject. Then, Leztiyani (2021) optimized this media for language and Indonesian literature competence. Asyhari and Sa'adah (2022) revealed the utility of Articulate Storylines in enhancing students' self-directed learning, particularly in studying biodiversity. Heliawati, Lidiawati, and Pursitasari (2022) developed Articulate Storyline through game-based learning to improve critical thinking and self-regulated learning. Meanwhile, Ananda et al. (2023) developed interactive Android learning using Articulate Storyline in the context of the independent curriculum. Despite several studies focusing on developing learning media based on Articulate Storylines, there is still unexplored research addressing the optimization of algebraic thinking using local wisdom contexts. Therefore, this research can be a reference for learning mathematics, especially in developing algebraic thinking skills.

METHOD

The research and development (R&D) method was employed in this research. The development model utilized in this study is the ADDIE model, which stands for Analysis, Design, Development, Implementation, and Evaluation (Branch, 2009; Spatioti et al., 2022). The Analysis phase involves

identifying problems to discover the main issues related to students' algebraic thinking abilities and determining design solutions through needs analysis activities, curriculum analysis, and technology utilization analysis. Subsequently, in the Design phase, the ideation investigation is conducted to generate appropriate and relevant problem-solving designs through material review, product design, and the development of test and non-test instruments. The third phase, Development, focuses on product development, namely the Articulate Storyline 3 learning media designed to include complete teaching materials with images and videos, sample questions and solutions, interactive quizzes, and exercises. Additionally, in this phase, product validation is carried out by media experts and mathematics experts. Product revisions may occur based on experts' recommendations and feedback until the product meets quality standards. Subsequently, the Implementation phase involves testing the product with users, namely high school X-grade students, both on a small scale (limited) and in a field trial. The Evaluation phase is the final stage of the product development procedure, which includes reviewing the overall process and assessing improvements recommended by validators and field trials. This aims to examine and ensure that the resulting product meets quality standards and addresses the issues. The flowchart of the development process for this learning media can be seen in Figure 1.

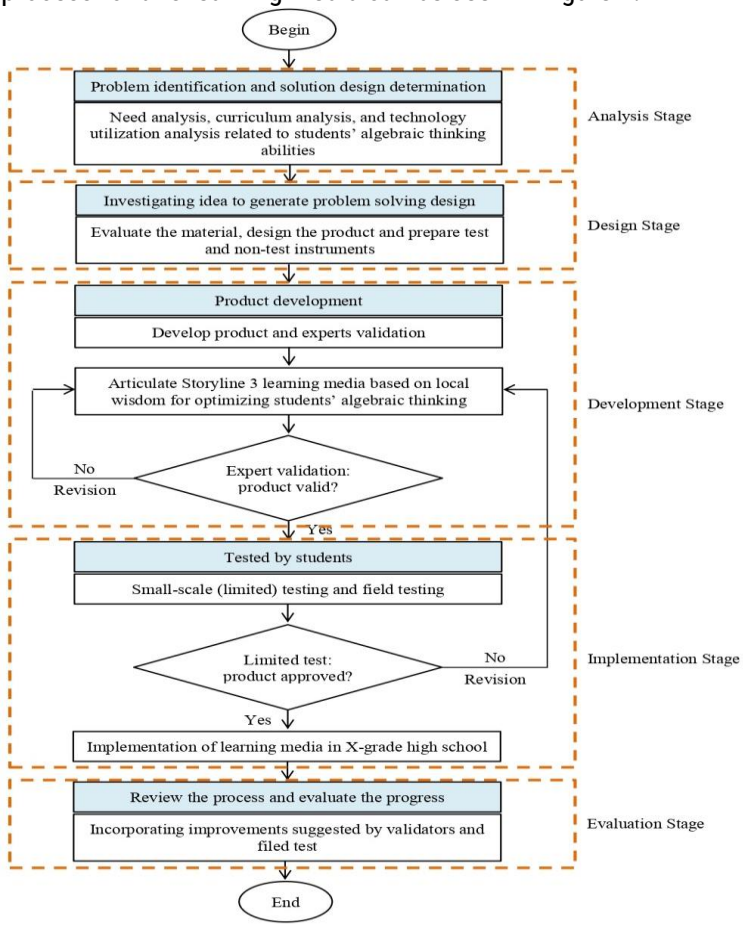

Figure 1. Learning Media Development Flowchart

The subjects involved in the development research of the locally wisdom-based Articulate Storyline 3 instructional media consisted of 37 tenth-grade high school students in the academic year 2023/2024, with a configuration of 7 students as participants in the small-scale test and 30 students for the field test. The analysis tasks and validator reviews to assess the content and learning media aspects of Articulate Storyline 3 based on local wisdom are carried out by five experts. The expert configuration participating in the study includes three experts in mathematics tasked with reviewing the feasibility of the teaching materials within Articulate Storyline 3 learning media based on local wisdom with the research objectives and the use of mathematical language, and two experts in media to assess the

coherence of the construction of Articulate Storyline 3 learning media based on local wisdom with the research objectives.

Table 1. Grid of Questionnaire

Aspects	Indicators per Aspect	Item Number
Media Expert		
Software	Effective and efficient use of media	1,2
	Easy to use and simple operation	3, 4, 5
Visual Communication	Communicative	6
	Navigation	7
	Audio	8,9, 10
	Visual	11, 12, 13
	Animation	14, 15
Media Usefulness	Provide an enjoyable learning atmosphere	16
	Facilitate the learning process	17
Mathematics Expert		
Content Feasibility	Relevance of concept to core competencies and essential competencies	1
	Relevance of concept to learning objectives	2
	Accuracy of concept	3, 4, 5 6,7 8
	Depth of concept	9
	Clarity of provided examples	10
	Systematic, coherent, logical, and clear flow	11, 12, 13
Language Use	Appropriate use of images in line with the concept	14
	Accuracy of sentence structure	15
	Use of communicative language	16
Presentation Technique	Delivery of concept aligns with the curriculum	17
	Material presented in a simple way	18
	Presentation of concept starts from easy to difficult	19
Student Response		
Software	Effective and efficient use of media	1,2
	Easy to use and simple operation	3, 4
Learning Design	Clarity of concept	5
	Systematic, coherent, logical, and clear flow	6, 7
	Learning support	8,9
Content Feasibility	Presentation of concept	10, 11, 12
	Presentation of questions related to daily life	13, 14, 15, 16, 17
	Feedback on evaluation results	18
	Use of language	19
Visual Communication	Audio	20
	Visual	21, 22, 23, 24, 25, 26, 27
	Navigation	28, 29
	Animation	30, 31
	Creative	32

Data collection for expert testing is done using a questionnaire consisting of 17 statements for media expert validation, 19 for mathematics expert validation, and 32 for student responses (Table 1.). In this study, the scoring categories used are modified Likert scale categories (Chen & Liu, 2020) with ratings: Very Good (4), Good (3), Less Good (2), and Very Poor (1).

The data generated in this study includes (1) the process data of designing learning media using Articulate Storyline 3 based on local wisdom, (2) the feasibility data of learning media through expert

examination and assessment, and (3) the practicality data of learning media seen from student responses to Articulate Storyline 3-based learning media with local wisdom. The data obtained from expert validation and student responses will be calculated using the formula (Uyangör, 2019):

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

RESULT AND DISCUSSION

Analysis Stage

The material used in developing locally wisdom-based learning media is for high school students in grade X in the second semester, namely trigonometric ratios in right-angled triangles. The selection of trigonometric ratios material is due to its relevance to daily life and the presence of many story problems, where students need to create problems using variables and find unknown values, such as calculating the height of a house, measuring the height of a tree, and determining the distance of a person. The difficulties students face in solving these problems, along with their weak algebraic thinking skills, necessitate interactive, locally wisdom-based learning media that incorporate local wisdom from Banten, making it easier for students to learn and understand the material. This is achieved by presenting real-life problems, illustrating problems in videos, and incorporating images and animations to stimulate students' interest in learning.

Based on field analysis, the main problems identified in the learning process include:

1. Low algebraic thinking skills among grade X students in a general high school in Serang, Banten. This is evidenced by the students' trigonometric ratio application test scores, with 26 students scoring below 75.
2. The mathematics learning process still frequently employs conventional teaching methods.
3. Students require instructional guidance through easily accessible learning media using computers or smartphones.
4. The absence of learning media used in the trigonometric ratio material learning process.

   Based on the findings, the researcher developed locally wisdom-based learning media to optimize algebraic thinking skills. The researcher utilized the Articulate Storyline 3 application to create learning media to assist students in independent learning. Additionally, the researcher used the Canva application to organize this learning media and the PowToon application for the instructional video incorporated into the learning media.

Design Stage

The next phase involves designing locally wisdom-based learning media based on the findings obtained in the previous phase.

1. Study Material Assessment Results

   The material of trigonometric ratios in right-angled triangles is the focal point used in this research. The subject matter is structured based on the mathematics teaching module used in schools. The essential competencies and achievement indicators within this module are as follows:

   Basic Competence: Explain and solve problems related to trigonometric ratios (sine, cosine, and tangent) in right-angled triangles.

   Achievement Indicators: Understand how to apply trigonometric ratios, determine the length of an unknown triangle side, and solve everyday problems by applying trigonometric ratios.
2. Product Design Results

   The storyboard is an image or sketch created to organize the instructional materials within the learning media. The storyboard can be seen in Figure 2.

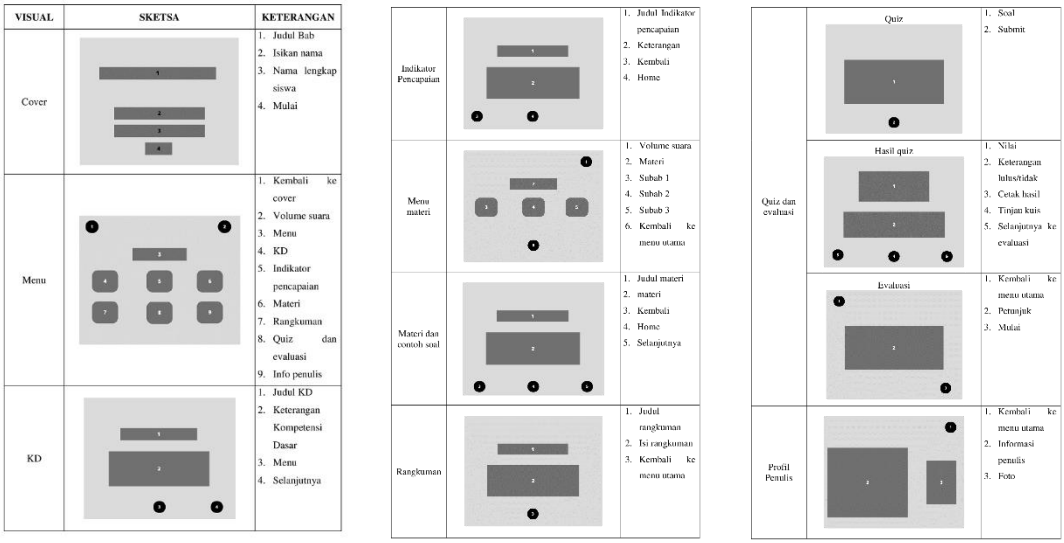

Figure 2. The Storyboard

Development Stage

The activities completed in the development phase involve creating the initial draft of the learning media and then confirming it with experts.

1. Initial Product Development

   The initial design of this locally inspired learning media includes instructional material, sample problems, quizzes, and exercises that can be accessed online via both computers and mobile phones (Figure 3.).

Figure 3. Initial Design of Articulate Storyline 3 Learning Media Based on Local Wisdom

The instructional material is presented with text and images to facilitate students' understanding. The provided sample problems are related to the local wisdom in Banten and are accompanied by explanations through videos within the learning media. The sample problems and solutions displayed in the learning media encompass indicators of algebraic thinking skills. The following is an overview of the initial design of the locally inspired learning media (Figure 4).

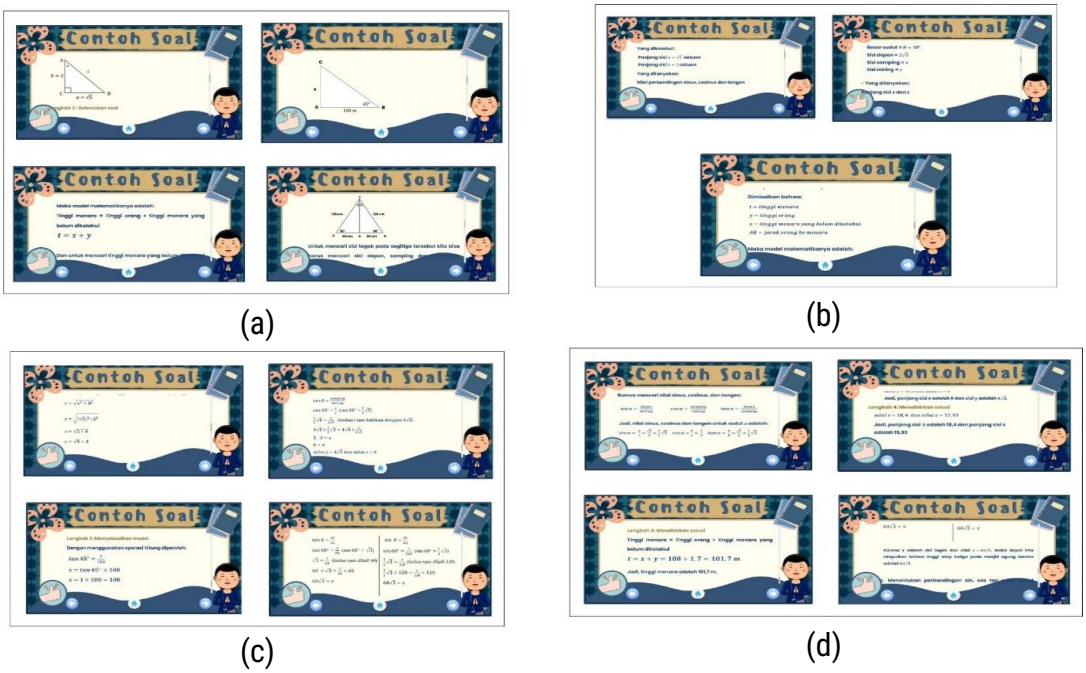

Figure 4. Display on Learning Media Adjusted to Algebraic Thinking Ability Indicators

Based on Figure 4. In part (a), the display in the media is directed toward the indicator of generalizing mathematical concepts into images or equations. This indicator is included in solving example problems presented in the local wisdom-based articulate storyline three learning media. In the solution to these example problems, it is explained that before solving the problems in the question, students need to sketch a picture or create a mathematical model tailored to the problem in the question. Part (b) shows the display in the learning media that includes the indicator of using variables as information about known elements. This is intended to facilitate students before determining the value sought in the problem. Part (c) shows the display in the learning media that includes the indicator of determining the variables being asked. In contrast, part (d) shows the display in the learning media, including the indicator of interpreting the information and representations created.

2. Product Validation by Experts

After the initial draft is complete, the product is validated by experts, such as media and mathematics experts. This stage is an assessment phase conducted by experts as validators of this local wisdom-based learning media.

a. Results of Media Expert Validation

Media experts evaluate the local wisdom-based learning media regarding software, visual communication, and utility. This evaluation is expected to provide feedback in the form of comments or suggestions from the perspective of learning media. The assessment results from media experts for the articulate storyline three learning media based on local wisdom can be seen in Table 2.

Table 2. Media Expert Assessment Result

Aspect	Score	Max Score	Percentage	Decision
Software	36	40	90,00%	Eligible
Visual Communication	70	80	87,50%	Eligible
Media Usefulness	14	16	87,50%	Eligible
Total	120	136	88,33%	Eligible

Based on Table 2, the results of the media expert validation are categorized as "Eligible," indicating that the locally inspired articulate storyline three learning media developed can be used as a teaching tool. However, some aspects need to be revised by the researcher, including outdated links and unclear audio in the sample problem videos. The researcher addressed these issues by changing the hosting from free to pay.

b. Results of Mathematics Expert Validation

Mathematics experts evaluated the instructional materials within the learning media concerning content validity, language, and presentation. This evaluation aimed to provide feedback, comments, or suggestions from the perspective of mathematics experts. In the locally inspired articulate storyline three learning media, instructional materials are structured with indicators of algebraic thinking skills. The following presents the assessment results from mathematics experts.

Table 3. Mathematics Expert Assessment Result

Aspect	Score	Max Score	Percentage	Decision
Content Feasibility	158	168	94,04%	Eligible
Language Use	22	24	91,67%	Eligible
Presentation Technique	34	36	94,44%	Eligible
Total	214	228	93,38%	Eligible

Table 3 shows that the results of the mathematician expert validation are categorized as "Eligible," meaning that the teaching materials inside the articulate storyline developed by the 3-based local wisdom learning media can be used as teaching materials in teaching and learning activities. However, several things need to be improved by the researcher before it is tested on students, including the addition of examples, the inconsistent use of angle symbols in example problems, unclear explanations of the positions of the front side of the angle, the side of the angle, the monotonous use of right-angled triangles, and the explanation of example problems to demonstrate the comparison of the use of tan and sin in solving unstructured problems is not well-structured.

Implementation Stage

The product, improved based on the experts' recommendations, was tested on students. This trial aimed to measure the algebraic thinking abilities of students and gauge their responses to the locally based articulate storyline three learning media developed. Following the expert test, the next stage was a small-scale trial. Seven students from class X participated in the small-scale trial given to a small group of students. Students were allowed to use their phones during the test, which took place outside of mathematics class hours. During the small-scale trial, students were given a test consisting of 2 essay questions and a student response questionnaire. The test was conducted twice, namely the pre-test and post-test. The purpose of the test was to measure the students' thinking abilities. The pre-test was given to students before using the locally based articulate storyline three learning media to measure the extent of students' algebraic thinking abilities in mathematics learning. Meanwhile, the post-test questions were given to students after using the locally based articulate storyline three learning media to determine whether there was an improvement in algebraic thinking abilities after using the locally based articulate storyline three learning media. In addition to the post-test, students were given a questionnaire to determine their responses to the locally based articulate storyline three learning media.

Here are the algebraic thinking ability test results and the student response questionnaire in the small-scale trial.

1. Analysis of Algebraic Thinking Ability Test Results

The algebraic thinking ability test was conducted twice, namely the pre-test and post-test. The algebraic thinking ability test aimed to determine the extent of improvement in algebraic thinking

abilities before and after using the locally based articulate storyline three learning media. Here is the descriptive statistical data of student performance in the small-scale testing and field trial.

Table 4. Statistical Description Data

Subject	Pre-test			Post-test			Achievement
	Max	Min	Mean	Max	Min	Mean	
Small-Scale Testing							
7	19	5	12,29	74	37	52,43	40,14
Field Trial							
30	45	1	13,43	65	37	48,23	34,89

We can see from Table 4 that algebraic thinking abilities improved after using the locally based articulate storyline three learning media compared to before using it. To assess the quality of the improvement in algebraic thinking abilities, an analysis of n-gain is required, which is observed from the score difference between the pre-test and post-test. Before analyzing, the data is transformed into n-gain index form. Here is the statistical analysis of n-gain index data in the small-scale trial.

Table 5. Result Analysis of N-Gain Index

Aspect	Subject	Number of Subjects	Average N-Gain Index
Algebraic thinking abilities	Small-Scale Testing	7	0,46
	Field Trial	30	0,39

Table 5 shows that the average n-gain index in the small-scale testing is 0,46, and in the field-scale testing is 0,39. Based on the n-gain categories, this average n-gain index falls into the moderate category, indicating an improvement in students' algebraic thinking abilities.

2. Analysis of Student Response Questionnaire Results

The student response questionnaire was given after the learning process using the locally based articulate storyline three learning media. The purpose of providing the student response questionnaire is to understand the criteria students find interesting in the locally based articulate storyline three learning media. The analysis of the questionnaire results obtained in the small-scale trial is as follows.

Table 6. Results of Student Responses in the Small-Scale Testing

Aspect	Score	Max Score	Percentage	Decision
Software	97	112	86,60%	Interesting
Learning design	373	420	88,81%	Interesting
Content Feasibility	435	500	87,60%	Interesting
Visual Communication	329	364	90,38%	Interesting
Total	1.234	1.396	88,39%	Interesting

The assessment of the student response questionnaire in the small-scale trial based on the software aspect received an average percentage rating of 86,60% with the criteria "interesting." The instructional design aspect received an average rating of 88,81% with the criteria "interesting," both the content feasibility and the visual communication aspect received an average percentage rating of 87,60% and 90,38% with the criteria "interesting." This indicates that the locally based articulate storyline three learning media developed falls within the "interesting" criteria and can be used as a learning media during teaching and learning activities.

Evaluation Stage

The final stage of the development method using the ADDIE model is the evaluation stage. In this stage, improvements and refinements are made to the locally based articulate storyline three learning media based on the assessments from expert reviews, small-scale trials, and field trials. The final product produced is the locally based articulate storyline three learning media that supports optimizing algebraic thinking abilities. In this study, the developed product is a learning media that includes

instructional materials, example problems and exercises accessible online through links provided by the researcher. Besides serving as independent learning material for students, this learning media can also be used by teachers as a tool in the mathematics learning process, especially for trigonometric ratios in right-angled triangles. The link accessible to both teachers and students is http://belajarbarengwian.org/.

Discussion

Based on the research results, an assessment of the development is deemed appropriate and interesting and shows an improvement in students' algebraic thinking abilities. The feasibility validation obtained a percentage of 93,38%, falling into the "feasible" category, and the student response received a percentage of 88.39%, falling into the "interesting" category. Based on the research findings, the average n-gain index in the product trial is 0,46 for small-scale testing and 0,39 for field-scale testing, falling into the moderate category. This indicates an improvement in students' algebraic thinking abilities; however, students have not yet mastered some indicators of algebraic thinking abilities. The visual representation of answers during the pre-test and post-test is presented below.

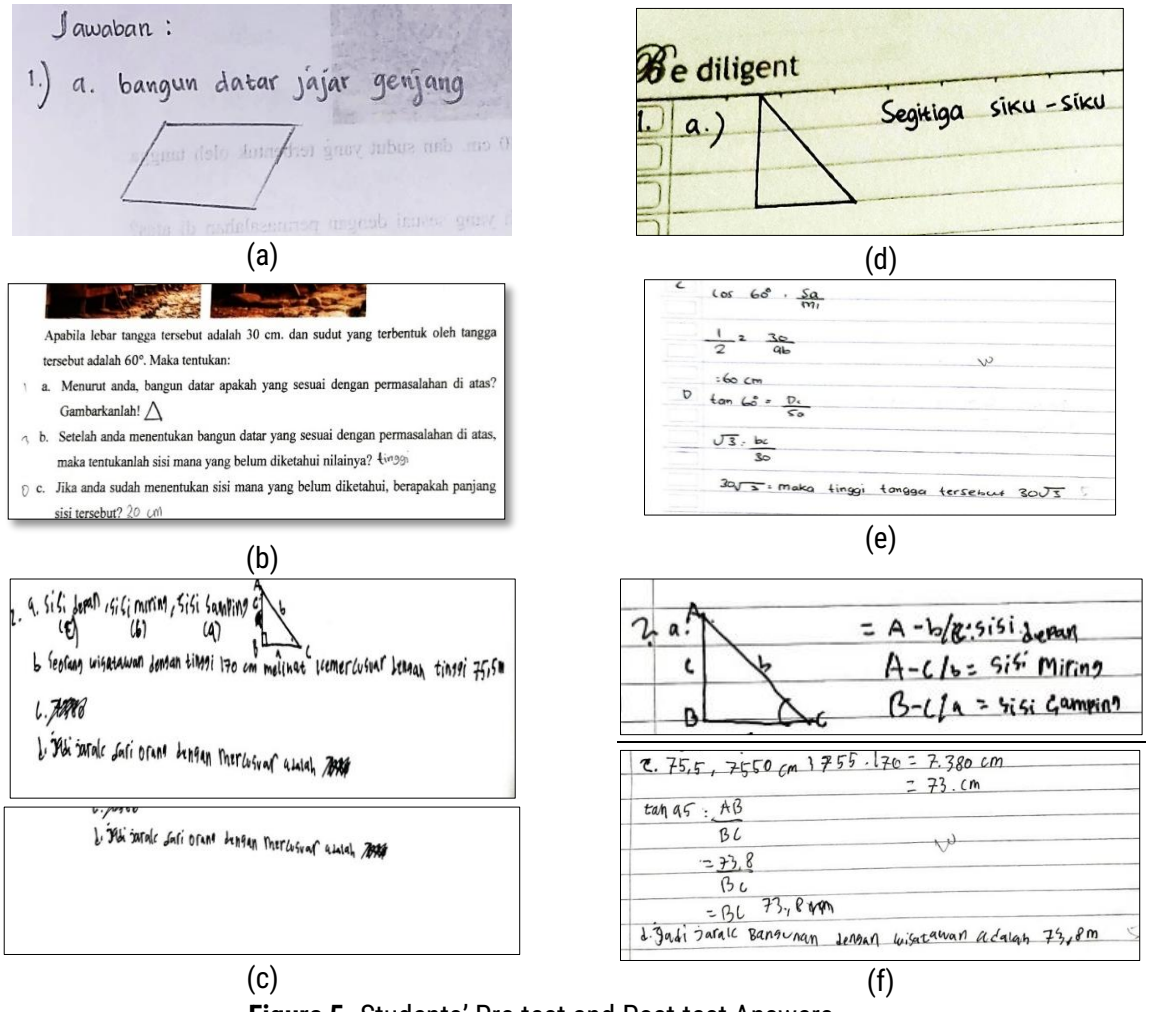

Figure 5. Students' Pre-test and Post-test Answers

Figure 5 (a) represents the students' answers during the pre-test. The question includes indicators of algebraic thinking skills, explicitly generalizing mathematical concepts into images or equations. The answer is incorrect as it does not depict a geometric figure suitable for the presented problem. It fails to show the ability to generalize mathematical concepts into images. Figure 5 (e) shows the students' answers during the post-test. The answer is correct, but it lacks completeness as the student did not name each side of the triangle in the drawn figure. Compared to the student's answer before using the

learning media based on local wisdom, it can be categorized as an improvement in the indicator of generalizing mathematical concepts into images.

Figure 5 (b) represents the students' answers during the pre-test, a question containing indicators of algebraic thinking skills, precisely determining the value of the variable in question. The answer is incorrect as the student immediately determines the result without explaining how the result was obtained. On the other hand, Figure 5 (e) represents the students' answers during the post-test. The answer is correct; however, the student is incomplete in answering the question, as the triangle depicted is not labeled on each side. Compared to the student's answer before instruction using the learning media articulate storyline three based on local wisdom, it can be categorized as an improvement in determining the variable's value.

Figure 5 (c top) represents the students' answers during the pre-test, a question containing indicators of algebraic thinking skills, specifically using variables as information about known elements. The answer is incorrect because the student failed to provide names for each side of the triangle. On the other hand, Figure 5 (f top) represents the students' answers during the post-test. The answer is correct; the student can now use variables to determine information about known elements in the given problem.

Figure 5 (c down) represents the students' answers during the pre-test, a question containing indicators of algebraic thinking skills, explicitly interpreting information and representations made. The answer is incorrect because the student cannot interpret the representation made; this happened because the student did not complete the previous question, making them unable to interpret the information and representations made. On the other hand, Figure 5 (f down) represents the students' answers during the post-test. The answer is correct; the student can now interpret the information and representations made in the given problem.

The ability to think algebraically is crucial for students in learning, especially in mathematics, as most activities require the ability to think algebraically and use symbols to solve problems. Mathematical problems are intellectual challenges involving questions or mathematics-related problems that require effort to solve, resulting in a solution (Afonso & McAuliffe, 2019; Faizah et al., 2020). Therefore, students' algebraic thinking skills need to be improved using learning media based on local wisdom to help them more easily understand how to find solutions to mathematical problems.

The development of local wisdom-based learning media is an effort to improve algebraic thinking skills in trigonometric comparison material in right-angled triangles; thus, students can solve problems related to daily life and become accustomed to independent learning. This aligns with research conducted by Papadopoulos (2019), stating that student activity and independent learning influence students' algebraic thinking skills in learning. Interactive multimedia, such as articulate storyline 3 in learning, conveys messages or information and stimulates students' minds, attention, and willingness, encouraging a more interactive and communicative learning process. Therefore, articulate storyline three significantly affects students' independent learning (Cadamuro et al., 2020; Kim & Li, 2021). Additionally, according to Pamenang (2021) and Shodikin (2024), local wisdom-based learning is essential for teachers to apply in beneficial learning to improve students' knowledge and understanding and instill a love for local wisdom in their area. It also instills positive character values following the noble values of local wisdom and equips students to face various problems outside of school.

Limitation and Recommendation

The locally wisdom-based articulate storyline three learning media developed has several advantages, among them are 1) improving algebraic thinking skills through presented examples and exercises that correspond to algebraic thinking indicators; 2) inviting students' attention due to its attractive appearance, explanatory videos facilitating understanding, and the availability of learning media as a tool for independent study; and 3) facilitating access anywhere and anytime via mobile phones or other hardware connected to the internet.

Several recommendations are proposed to enhance the effectiveness and comprehensiveness of the Articulate Storyline 3-based Local Wisdom Learning Media. Firstly, considering the utilization of free hosting, it is suggested that accessibility limitations associated with paid hosting be addressed. This approach aims to facilitate unrestricted access to the learning media without time constraints.

Secondly, there is a recommendation to expand the content to cover various mathematical topics. This expansion is intended to increase the diversity and relevance of the learning media. Additionally, it is advised to augment the material with examples that focus on algebraic thinking skills. This addition aims to better assist students in generalizing mathematical concepts into equations. Lastly, offline accessibility is recommended to provide more flexible access options. While the media is primarily designed for online access, offering alternatives for offline access is particularly beneficial for students with limited internet connectivity. These recommendations are anticipated to elevate the quality and accessibility of the Articulate Storyline 3-based Local Wisdom Learning Media, contributing to the optimization of students' learning processes.

CONCLUSION

Based on the review of the results and discussions, it can be concluded that the articulate storyline 3-based local wisdom learning media shows promising potential for enhancing algebraic thinking skills. The overall feasibility of the media is evidenced by a high total percentage of 93,38%. Moreover, students responded positively to the learning media, indicating strong interest with an 88,39% rating. Although improvements in algebraic thinking skills were moderate, as indicated by an average n-gain index of 0,46 for small-scale testing and 0,39 for field-scale testing, the results suggest a positive impact on student learning outcomes. For future research, it is recommended to explore free hosting for learning media to alleviate creator burdens, enhance interactivity in the presentation of teaching materials to optimize skill development and diversify learning media content to cater to student preferences and engagement better. In addition to the conclusions drawn from the review of results and discussions, several implications arise from the findings: 1) The positive response to the articulate storyline 3-based local wisdom learning media suggests its potential for use in educational settings; 2) insights gained from this study can inform curriculum developers about effective strategies for integrating technology-enhanced learning materials into algebra education; 3) teachers can benefit from training programs focused on effectively utilizing technology in teaching mathematics; 4) the moderate improvement in algebraic thinking skills warrants further investigation into optimizing learning media design and instructional strategies; and 5) the high level of student interest in the learning media underscores the importance of incorporating engaging and interactive elements in educational materials.

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