IRJE |Indonesian Research Journal in Education| |Vol. 9| No. 1|June|Year 2025|

Development of ispring suite 9 learning media to improve learning outcomes

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Abstract

This research is development research (R&D) with the ADDIE model that aims to design and develop learning media using iSpring Suite *9* for grade IV elementary school students, especially in science and social studies. In addition, this research also aims to test the feasibility and effectiveness of the developed media. This research used test and non-test techniques, which included observation, interviews, questionnaires, and documentation. The validity test results showed that Keratara learning media obtained a score of 92% from media experts based on appearance, usage, and usefulness. Meanwhile, the material validation, which included aspects of accuracy with the material, suitability for the thinking ability of students, support for learning content, and achievement of learning objectives, received a score of 95%. Therefore, the findings indicated that the iSpring Suite 9-based interactive learning media developed is valid and effective in supporting elementary school students' learning process and improving their learning outcomes.

Keywords
Development, interactive media, iSpring Suite 9, learning outcomes

Article History
Received 17 February 2025
Accepted 28 May 2025

How to Cite
Yuhandani, S. R., & Putra, G. M. C. (2025). Development of iSpring Suite 9 learning media to improve learning outcomes. *Indonesian Research Journal in Education |IRJE|*, *9*(1), 422-436. https://doi.org/10.22437/irje.v9i01.41880

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Introduction

Education is one of the most important roles for humans, especially when facing life's challenges. This is due to the influence of education, which covers all aspects of a person's personality and life development. As something universal, education can be accessed and owned by every child in the nation without exception (Keshav et al., 2022). Significant efforts to improve the quality of education certainly face challenges that can hinder the achievement of educational goals. This is as stated in Law No. 20 of 2003 concerning the National Education System Chapter I Article 1 Paragraph 1, which states: "Education is a conscious and planned effort to create a learning atmosphere and learning process so that students actively develop their potential to have religious, spiritual strength, self-control, personality, intelligence, noble character, and skills needed by themselves, society, nation, and state." So far, the education system is traditional and focuses on conventional teaching methods. This system tends to be rigid and less in tune with the dynamics of the development of science and technology (Hasanah et al., 2023). However, the current reality shows that there are still many problems in elementary schools, including communication during the learning process, which feels monotonous, boring, and passive because it only focuses on the teacher with the lecture method (Amin et al., 2021). Science and Social Studies are innovative subjects in the previous curriculum. In science and social studies subjects, especially in social studies content, some materials are abstract and require concretization. Learning media allows students to actively participate in the learning process to support the improvement of their understanding (Twiningsih & Elisanti, 2021). With the help of learning media, students can feel more enthusiastic during the learning process so that the material delivered by the teacher can be better received (Putri et al., 2022).

Without realizing it, technological advances are developing very rapidly from time to time. The advancement of science is also very dependent on the development of technology, which also marks the rapid progress of the modern era (Afifa & Astuti, 2024). Using technology benefits schools, teachers, and learners in completing their tasks. Technology is a supporting tool in education that assists the learning process, achieving the goals that have been designed (Qureshi et al., 2021). The use of interactive learning multimedia that combines audio-visual components in delivering material can increase students' interest in learning (Taiyeb et al., 2017). Interactive learning media are now important in modern education, especially in overcoming students' challenges in understanding abstract Science and Social Studies concepts (Guswita et al., 2024). By integrating interactive elements such as animations, simulations, and multimedia presentations, learners can visualize complex processes and more easily understand the underlying fundamental principles.

Based on data from interviews and observations at SDN Pakintelan 03 in Semarang City, several problems were found in Science and Social Studies learning, among others: 1) The utilization of technology by teachers as learning media is still not optimal; 2) The media used for Science and Social Studies learning so far is only a learning video shown through an LCD projector; 3) The sources used are books and LKS, but students are often unable to achieve learning objectives optimally; 4) The low motivation of students to learn; 5) The learning outcomes of grade V students in science and social studies subjects are still relatively low. Of 16 students, the end-of-semester summative score shows that 62% of students have reached the minimum completion

criteria of 70, while the other 38% have not yet reached completeness. This research focuses on the social studies content of Chapter 5, "What the Area Where I Used to Live Was Like." The selection of this material is based on the results of a questionnaire analysis of the needs of teachers and students. This shows that students have difficulty understanding this material due to its broad scope and lack of innovation in using technology-based learning media.

The use of learning media has an important role in improving students' learning outcomes as well as motivating them to learn. Learning media is a tool that greatly supports knowledge development, especially for students in the science and social studies learning process (Ningsih & Jha, 2021). The main characteristic of interactive learning media is encouraging learners to pay attention to the material or objects presented and actively interact during the learning process (Harsiwi & Arini, 2020). The lack of innovation in learning media development is caused by teachers' limited mastery of technology and the lack of time due to the demands of school administration. As a solution to this problem, researchers developed interactive learning media using iSpring Suite 9. This media has a simple initial design, is flexible, and can be accessed anytime and anywhere, thus supporting more effective learning (Sekhar & Goud, 2024).

iSpring Suite is a computer-based media that can be used to present learning materials while supporting the implementation of active debate methods, thus helping students understand the material more easily (Wijayanto et al., 2017). iSpring Suite, developed by researchers, can create offline HTML, add videos, combine images, and create interactive quizzes converted through the website 2 APK builder. This media supports enjoyable and practical learning, especially in improving students' learning outcomes (Kurniawan & Sumargono, 2021). In addition, the material is equipped with relevant images so that the display is not monotonous and more interesting. To create a pleasant learning atmosphere, this media is also equipped with background music that arouses students' enthusiasm during the learning process. This media also provides opportunities for learners to hone their understanding through interactive quiz features. At the end of the lesson, evaluation questions with automatic scores are immediately displayed. If the evaluation results have not met the learning target completeness of 70%, learners can continue with remedial questions to improve their learning outcomes. This encourages learners to be more serious in understanding the material and completing assignments well (Elida et al., 2024).

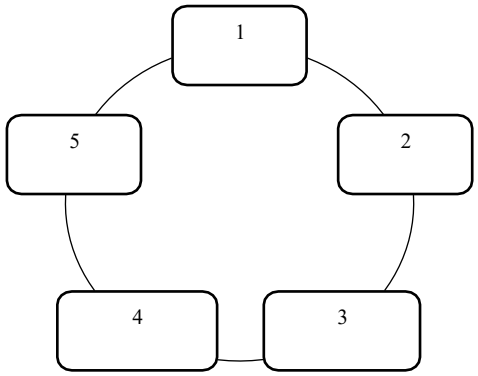
Based on the results of previous research conducted by Firdha and Zulyusri (2022), Ikmawati et al. (2023), and Nabila et al. (2023), interactive learning developed with iSpring Suite proved to be practical and feasible to use in the learning process. The advantages of iSpring Suite 9 in integrating visual, audio, and video elements make learning materials more interesting and interactive. This has a positive impact on learning motivation and improving student learning outcomes. Furthermore, Bhakti et al. (2024) and Pradja et al. (2024) explained that iSpring Suite can increase learners' engagement more interactively with learning materials. This helps learners understand complex concepts more deeply while increasing learning retention. Although similar to some previous studies that utilize iSpring Suite as a learning medium, this research has fundamental differences in terms of the topic of the material and the focus of its development. The purpose of this research is to develop iSpring Suite 9 interactive learning media, test its feasibility, effectiveness, and improve the learning outcomes of the material "What the Area Where I Used to Live Was Like" in the IV grade of SDN Pakintelan 03 in Semarang City. In addition, using iSpring Suite 9 interactive learning media can positively impact the quality of

science and social studies learning, especially on the material "What the Area Where I Used to Live Was Like."

Methodology

This research uses the Research and Development (R&D) method to create a specific product while testing its effectiveness. According to Sugiyono (2019), this method can be used to produce new products. Research and Development (R&D) is a series of processes or stages that aim to create new products or improve existing products through further development. The research design used is a development design based on the ADDIE model (Analysis, Design, Development, Implementation, Evaluation), which is a systematic approach to the instructional or learning development process. This model consists of five interconnected stages that form a continuous development cycle (Elida et al., 2024). The following is a chart of the ADDIE model.

Figure 1. *ADDIE concepts* (Branch & Varank, 2009)



In the initial stage, namely analysis, researchers collected data at SDN Pakintelan 03 through interviews and observations with the principal and grade IV teacher. In addition, researchers also distributed questionnaires to teachers and students to identify their needs. This is done to determine the appropriate learning resources so that they can be a solution to the existing problems (Ho & Lim, 2021).

The second stage is designing the concept or design. At this stage, researchers designed products based on the results of analyzing the needs of teachers and students (Rizal et al., 2021). The steps taken include: (1) determining Learning Outcomes and Learning Objectives; (2) selecting elements such as images, audio, and video that will be used in the media; (3) determining color combinations, fonts, and attractive objects; and (4) compiling detailed product specifications.

The third stage is the development stage, where the pre-planned design is transformed into a usable iSpring Suite 9 interactive learning media. In this process, researchers began to realize the concept design and product content in digital form. Researchers also prepare evaluation tools in the form of pre-test and post-test questions, which aim to measure the extent to which this learning media is effective in helping students achieve the learning objectives that have been set. After the learning media have been developed, the next stage is validation by media and material

experts. Input from experts is used to improve and perfect the media before being tested on students (Simbolon, 2023).

The fourth stage is implementation. Researchers conducted small-scale and large-scale trials involving IV-grade students at SDN Pakintelan 03. Researchers used website-based interactive learning media developed using iSpring Suite and APK 2 Builder in the learning process. At this stage, pre-tests and post-tests were conducted to measure the effectiveness of the media in supporting learning. In addition, a response questionnaire was also given to the IV-grade teacher and students to obtain feedback on using the media. The feedback received through this questionnaire is the basis for evaluation and improvement so that the learning media is more optimal and according to user needs.

The final stage is evaluation, which involves a series of assessments after implementation. This evaluation aims to gather user feedback and assess the teaching program's effectiveness. The evaluation focuses on identifying the learning media's weaknesses and improving them to make it more optimal (Spatioti et al., 2022). The iSpring Suite 9 interactive learning media developed was evaluated thoroughly. The evaluation process was conducted after the media went through the stages of design, development, validation, and refinement based on recommendations from the validators.

This research was conducted at SDN Pakintelan 03, which is located at Langkir Street RT 01 RW 05 Pakintelan Village, Gunungpati District, Semarang City, Central Java Province. The subjects in this research were IV-grade students of SDN Pakintelan 03, totaling 26 students divided into large groups (20 students) and small groups (6 students), IV-grade teachers of SDN Pakintelan 03, and media and material expert lecturers. Before collecting the data, all questionnaires and questions were tested for validity and reliability and consulted with the lecturer. To determine the validity level of the media, researchers used the following assessment criteria:

Table 1. *Product feasibility assessment criteria*

Percentages	Criteria
81% - 100%	Very Feasible
61% - 80%	Feasible
41% - 60%	Less Feasible
21% - 40%	Not Feasible
0% - 21%	Very unfeasible

Source: Saputra et al. (2020)

The pre-test and post-test instruments were designed in the form of 20 multiple-choice questions. Learning media is considered adequate if there is an increase in student learning outcomes from the pre-test to the post-test after using the media (Fatchurahman et al., 2022). The limit of the completeness value or learning achievement criteria used is 70. Learners are declared to have reached completeness if they get a minimum score of 70 or more. The calculation process is carried out with the following steps:

$$\text{Percentage score} = \frac{\textit{students with a score} > 70}{\textit{number of students}} \times 100\%$$

The last data analysis was carried out to evaluate the effectiveness of the media based on the results of the pre-test and post-test that students had done. The data obtained was then calculated using the N-gain formula. The N-gain test is a commonly used method to measure the effectiveness of learning or intervention in improving student learning outcomes (Sukarelawa et al., 2024).

$$\text{N-Gain} = \frac{\text{post-test score} - \text{pre-test score}}{\text{Maximum score - pre-test score}}$$

The results are presented based on the following criteria:

Table 2. *Categories of interpretation of N-Gain effectiveness*

Coefficient Interval	Criteria
N-gain < 0,3	Low
0,3 < N-gain < 0,7	Medium
N-gain > 0,7	High

Source: Guntara (2021)

Results

This research tested the feasibility, evaluated effectiveness, and improved learning outcomes through iSpring Suite 9 interactive learning media on "What the Area Where I Used to Live Was Like." in grade IV of SDN Pakintelan 03 in Semarang City. The research data was obtained through various methods, including observation, interview, questionnaire distribution, pre-test and post-test implementation, and documentation conducted at SDN Pakintelan 03.

Analysis phase results

During the analysis phase, the researchers collected data using interviews and observations and identified existing problems at SDN Pakintelan 03. Based on these activities, the use of digital learning media at SDN Pakintelan 03 was still minimal, primarily due to the limited ability of teachers to utilize it. In terms of facilities, the school had already provided adequate resources, such as Wi-Fi access and a policy allowing students to bring devices like mobile phones or laptops if needed, with full support from parents. However, learning still relied heavily on student worksheets and instructional videos from YouTube, which tended to be monotonous and less interactive. This resulted in low student engagement, contributing to learning outcomes that had not yet met the learning achievement criteria.

The researchers collected various literature sources as supporting data to serve as the foundation for developing learning media. In addition, they distributed questionnaires to identify the needs of both students and teachers, which indicated that the developed learning media received a positive response (Angelina, 2020). Furthermore, the researchers gathered data from daily test results and grades from the previous semester to gain an overview of students' learning achievements before implementing the learning media. Using digital learning media was an appropriate strategy to align the educational process with the developments of the modern era (Bilynska et al., 2024).

Design planning stage results

The design planning stage was one of the crucial phases in developing learning media based on iSpring Suite and APK 2 Builder. In this process, several steps were carried out, including formulating learning objectives that met the SMART criteria—specific, measurable, achievable, relevant, and time-based; determining effective learning strategies to achieve these objectives, including an appropriate combination of media and methods; and identifying other supporting resources, such as teaching materials, learning environments, and various resources that could support the learning process (Adeoye et al., 2024).

The developed learning media adopted a combination of tutorial and drill-and-practice formats to facilitate and support users in utilizing multimedia optimally (Silaban et al., 2022). The tutorial format was designed to guide students through the learning process by following the instructions embedded in the learning media, resembling the role of a teacher in providing directions during learning activities. In the navigation design, a home-shaped button functioned as a return button to the main menu, while arrow buttons were used to move to the next or previous section. A speaker button also turned the background music on and off.

Meanwhile, the drill-and-practice format was applied in the evaluation section, serving as a feedback mechanism for students when completing practice questions (Herodotou et al., 2022). Each completed question received immediate feedback, allowing students to understand the results and evaluations of their answers. In the initial product design, visual aspects such as font type, text color, and image selection were also considered to enhance the learning media's readability and attractiveness.

Figure 2. *The main display, user guide, and menu [in Indonesian language]*

Source: APK Keratara

Development stage results

The next stage was the development stage. This research is developing the Keratara learning media, which focuses on the history of kingdoms in the Indonesian archipelago for the science and social studies subjects for fourth-grade students at SDN Pakintelan 03 in Semarang. The Keratara media was developed to support the effectiveness of material delivery by educators and to facilitate students' understanding of the subject matter (Adilah & Minsih, 2022). The product development in this research focused on refining the content of evaluation questions. If students did not achieve the learning achievement criteria of 70 during the evaluation stage, they could immediately work on remedial questions. Additionally, in quizzes, evaluations, and remedial exercises, students received immediate feedback, which displayed their scores. The following is the development display.

The researcher also conducted a validation process by experts to assess the validity of the media and the developed material. This validation activity aimed to evaluate the feasibility of the product before its implementation in the learning process, ensuring that the media and the developed content. This validation aimed to assess the feasibility of the product before its implementation in learning, ensuring that the developed media met quality standards and supported students' learning processes. The data obtained was then analyzed and categorized based on achievement criteria. The material expert validation with five assessment indicators was evaluated: accuracy with the subject matter, alignment with students' cognitive abilities, support for learning content, contribution to achieving learning objectives, and reinforcement of instructional materials.

Table 3. *Material expert validation*

Aspects assessed	Score	
	Ideal scores	Actual scores
Accuracy with the subject matter	**10**	**10**
Alignment with students' cognitive abilities	10	9
Support for learning content	25	23
Support for achieving learning objectives	10	10
Support for learning objectives	15	15
Total score	67	
Percentage	95%	

Source: Research data processing results

The content expert assessment received a feasibility percentage of 95% with a classification of "highly feasible." The content expert provided input suggesting that, before delivering the material, an appraisal should be conducted by presenting examples that students can easily find daily. Additionally, the expert recommended improvements to the activity instructions. For the media validation, four assessment indicators were evaluated: media aspects, usability aspects, and usefulness aspects, as presented in the table below.

Table 4. *Media Expert Validation*

Aspects Assessed	Scores	
	Ideal Scores	Actual Scores
Media Aspect	25	24
Display Aspect	25	22
Usability Aspect	15	14
Usefulness Aspect	10	9
Total Score	69	
Percentage	92%	

Source: Research data processing results

The assessment conducted by the media expert validator showed that the learning media achieved a feasibility percentage of 92%, indicating that it fell into the "highly feasible" category for use. However, in this research, the media expert also provided several suggestions for improvement to enhance the quality of the developed media. These suggestions included (1) improvements to the initial page, along with adjustments to color and font, (2) optimization of the menu layout for better usability, and (3) refinement of the developer profile information.

Figure 3. *Keratara media revision results [in Indonesian language]*

Source: APK Keratara

Following improvement suggestions from the media expert, the researchers made revisions to the Keratara learning media, including enhancements to the initial display, menu layout adjustments, and developer profile refinements.

Implementation stage results

After the researchers revised the design of the media product, testing was conducted to assess its effectiveness. This trial was carried out in the fourth-grade class of SDN Pakintelan 03, involving 26 students in the science and social studies learning process. The purpose of this test was to obtain information regarding the effectiveness of the Keratara media in supporting the learning process, particularly in enhancing students' understanding of the material on the kingdoms in the Indonesian archipelago. In the Keratara learning media trial, the assessment was conducted through questionnaires consisting of 15 questions for teachers and 12 questions for students, administered in both small and large classes.

Table 5. *Small-scale response results*

Responses	Total scores	Percentages	Criteria
Students	276	95,83%	Highly feasible to implement
Teachers	59	98,33%	Highly feasible to implement

Source: SPSS data processing results

Table 6. *Large-scale response results*

Responses	**Total scores**	**Percentages**	**Criteria**
Student	1212	97,11%	Highly feasible to implement
Teacher	59	98,33%	Highly feasible to implement

Source: SPSS data processing results

Based on students' responses to the Keratara learning media, a score of 1,212 was obtained out of a total score of 1,248, equivalent to 97.11%. Meanwhile, teachers' responses scored 59 out of a total score of 60, or 98.33%. These results indicated that the Keratara learning media were highly suitable for implementation in learning.

Evaluation phase results

The final stage of this research was evaluating the implementation of the Keratara learning media based on teachers' and students' responses. This evaluation aimed to determine the improvement in learning outcomes after using the media. The increase in students' learning achievement was analyzed based on the average N-Gain of 26 students, six in the small group and 20 in the large group.

Table 7. *N-gain results*

Grades	**N**	**N-Gain average**	**Categories**
Large group	20	0,7943	High
Small group	6	0,7897	High

Source: SPSS data processing results

Based on the N-Gain test results, a score of 0.7943 was obtained for the large group and 0.7897 for the small group, which fell into the "high" category in improving students' learning

outcomes. These findings indicated that the use of the Keratara learning media (Kingdoms in the Archipelago) in the science and social studies subjects for the topic What Was My Living Area Like in the Past contributed to the improvement of IV-grade students' learning outcomes at SDN Pakintelan 03.

Discussions

The results of this research demonstrate a high level of consistency. The findings align with the research objectives outlined in the introduction, covering feasibility, practicality, and effectiveness. Based on the presented results, developing the iSpring Suite 9 interactive learning media is deemed suitable for implementation as a learning medium for Science and Social Studies in the IV grade of SDN Pakintelan 03. The effectiveness of this medium is evidenced by the improvement in students' learning outcomes before and after its use.

Qoni'ah and Kuntjoro (2023) indicated that iSpring Suite 9-based learning media for environmental change material is suitable for learning. Its feasibility is based on aspects of validity, practicality, and effectiveness. The validity results reached 95.25%, which is categorized as highly valid, while its practicality score was 95.83%, classified as highly practical. In terms of effectiveness, based on critical thinking learning outcome indicators, a percentage of 86.46% was obtained, which falls into the highly effective category. The difference in this research lies in the method used, which is quantitative descriptive, and the development model that applies the 4D stages (Define, Design, Develop, Disseminate).

Khasanah and Setyasto (2024) resulted in data analysis showing an increase in students' pre-test and post-test scores, with an average difference of 33.05 and an N-gain of 0.70, which falls into the high category. These findings prove that using Interactive Mobile Learning (Imole) supported by iSpring Suite is feasible, practical, and effective in improving the learning outcomes of fifth-grade students in science subjects, particularly in ecosystem and food web material. These results align with previous studies that classified the media as feasible and contributing to improved learning outcomes. Additionally, these findings indicate that further development is needed to encourage future research.

iSpring Suite enables the rapid development of educational materials tailored to the characteristics of elementary school students (Minnakhmitova et al., 2023). According to Siregar (2022), the presence of videos, audio, and animations in interactive learning multimedia can facilitate the visualization of complex materials that are difficult to explain solely through text, images, or conventional teaching aids. Therefore, the researcher developed the Keratara media based on iSpring Suite 9 as a more effective learning solution. Based on the presented findings, learning media development, with the final product being Keratara media, has proven effective in improving learning outcomes in science and social studies content. The increased effectiveness of this learning media is evident from the rise in students' average pre-test and post-test scores, from 51.3 to 89.6. Additionally, the media achieved a material mastery rate of 95%, and the N-Gain test results showed an increase of 0.79, which falls into the "High" category. These findings confirm that developing iSpring Suite-based learning media using the ADDIE model is feasible, practical, and capable of enhancing Science and Social Studies learning outcomes for IV-grade students at SDN Pakintelan 03 in Semarang City.

Conclusion

Based on the research results, developing the iSpring Suite 9 interactive learning media for the Science and Social Studies subject in IV grade at SDN Pakintelan 03 has been proven to be feasible and effective for use in the learning process. This media successfully enhances students' learning outcomes in "What the Area Where I Used to Live Was Like" in IV grade at SDN Pakintelan 03, Semarang City. The research process involved several stages, beginning with the analysis stage, where the researcher conducted observations, interviews with the school principal and IV grade teacher, and distributed questionnaires to gather the necessary data. Next, the researcher developed the learning media in the design stage by considering the collected data. The following stage was development, where media and subject matter experts validated the designed media before being implemented in the learning process.

The validation results indicate that the learning media received a rating of "highly feasible," with a percentage of 95% from the subject matter expert and 92% from the media expert. After the validation stage, the media was implemented in the learning process, and its effectiveness was tested through pre-test and post-test assessments. During the evaluation stage, learning improvement was analyzed using the N-Gain test. The test results showed that the large group obtained a score of 0.7943, while the small group scored 0.7897, both of which fell into the high improvement category. Thus, the iSpring Suite 9 interactive learning media can be feasible, effective, and capable of enhancing students' learning outcomes in the IV grade science and social studies subjects.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest.

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