

Development of i-spring learning media about animal life cycle for primary schools students

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Abstract: The science learning process will be more meaningful if it includes facts, concepts, scientific ways of thinking, and solving problems. Meaningful learning will make it easier for students to understand science concepts. Material on animal life cycles and environmental conservation is one of the materials studied at the elementary school level. In general, students find it difficult to learn the material, because the material is abstract. I-Spring learning media can help contextualize abstract material and increase learning effectiveness. This research aims to develop I-Spring-based learning media products on animal life cycle materials and environmental preservation for elementary school students. This research is development research using the ADDIE development model. The research procedure consists of analysis, design, development, implementation, and evaluation. The subjects of this study were 20 grade 4 students of SDN Tanjungrejo Malang City. The results of media validation showed a score of 91.74%, material validation was 96.18%, and learning validation was 94.04%. while the attractiveness of I-Spring learning media products obtained a score of 90.55%. Thus, learning media are very feasible to use to support the effectiveness of the science learning process.

Keywords: spring learning media; animal life cycle; primary schools

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Introduction

Natural science is knowledge related to natural phenomena. This knowledge includes facts, concepts, ways of working, thinking and solving problems (Syawaludin et al., 2019). At the elementary school level, science learning will be more meaningful if the learning process involves simple scientific investigations, discussions and other student-centered activities (Siregar, 2018). With meaningful learning, students will gain more experience and can develop their understanding of concepts.

Material on animal life cycles and environmental conservation is one of the topics in elementary school science learning. Material on animal life cycles and environmental conservation includes types of animal life cycles, metamorphosis of animal life cycles, and environmental conservation. In this material, students are usually shown the life cycle of an animal in the form of a picture of the sequence of an animal's life development from when the animal hatches to becoming an adult animal.

Students often have difficulty understanding the concept of animal life cycle material, because the animal life cycle process is abstract and there are various changes in shape in the animal life cycle (Tampubolon, 2021). This is also in line with the results of observations made on students at SDN Tanjungrejo, Malang City, which showed that 43% of students did not reach the minimum criteria for completeness in science learning. This shows that students' understanding of concepts in science

material is less than optimal. Apart from that, the class teacher also said that so far the learning process has not used a variety of learning media, due to limited facilities and infrastructure at school.

Creative use of learning media can help contextualize abstract material (Kurniawan et al., 2019). The use of varied learning media can also facilitate and increase learning efficiency (Arsyad, 2018). Learning media can provide a more interesting learning experience, making it fun for students (Rini et al., 2019; Taufiq et al., 2014). Learning media equipped with content, images and animation can make it easier for students to understand and remember the concepts of the material (Panjaitan et al., 2020).

One learning media that can support the science learning process is I-Spring based Learning Media. I-Spring Learning Media is software that is integrated with Powerpoint. This I-Spring learning media presentation file becomes flash and can be quickly inserted into Microsoft Powerpoint. I-Spring learning media can contain audio, video, presentations, interactive discussions and quizzes. I-Spring learning media can improve students' critical thinking skills (Mughtar & Nasrah, 2021), motivation (Palguna et al., 2020), and students' problem solving abilities (Rahmah, 2017). Apart from that, the use of I-Spring media can improve the quality of learning (Irtawaty et al., 2018). Thus, this research aims to develop I-Spring based learning media products on Animal Life Cycles and Environmental Conservation for elementary school students.

Method

This research is Research and Development (R&D), with the ADDIE development model. The activity stages in the ADDIE model are analysis, design, development, implementation and evaluation. At the analysis stage, researchers carry out an analysis of the needs of the product to be developed. Identification of product needs analysis is carried out through observations and interviews with school principals, class teachers and students regarding the ongoing science learning process. Apart from that, at the analysis stage, researchers also analyze the learning material based on the competencies and indicators that will be achieved during the learning process.

The design stage was carried out by designing I-Spring based learning media products on Animal Life Cycle material. The design process includes designing learning media design specifications, material structure, video structure and practice questions. At this design stage, researchers also designed storyboards for I-Spring based learning media products on Animal Life Cycle material. The storyboard includes menu, content and evaluation components contained in I-Spring based learning media.

In the development stage, researchers developed I-Spring based learning media teaching material products on Animal Life Cycle material according to the storyboard that had been prepared previously. Next, I-Spring based learning media products were validated with media expert sources, material experts and learning experts. The resource persons involved are people who have experience in the field of science learning and learning media development. This validation was carried out to test the feasibility of learning media products, including material content, media presentation and learning structure.

In the implementation stage, the researcher implemented I-Spring based learning media products on Animal Life Cycle material to class IV students at SDN Tanjungrejo 2, Malang City, totaling 20 students. Next, the evaluation stage was carried out to evaluate whether the I-Spring based learning media product on Animal Life Cycle material could be used in learning and was interesting for students.

The data analysis used is feasibility data analysis and attractiveness data analysis of I-Spring based learning media. Data analysis techniques use quantitative and qualitative data analysis. Qualitative data analysis includes suggestions/input by material, media and learning experts regarding improvements to the media being developed. Meanwhile, quantitative data analysis takes the form of expert assessment scores on material, media and learning, and students who fill out questionnaire statements. Quantitative data was analyzed using percentage techniques.

Results and Discussion

The results and discussion section includes research findings obtained from research data and is accompanied by a discussion comparing research results with relevant theories. The results of this development research are in the form of I-Spring based learning media on Animal Life Cycle Material. Product descriptions of I-Spring based learning media on Animal Life Cycle Material and feasibility test results, as well as the attractiveness of the media are described in the following subsections.

Product Development Results

The product developed is I-Spring based learning media on animal life cycle material for fourth grade SD/MI students. This media can be accessed at <https://bit.ly/ispring-daurlivebangun>. I-Spring based learning media on animal life cycle material consists of an initial display, menu page, application description, learning objectives, learning materials, practice questions, and application developer profile. The initial appearance of the application consists of an application opening page and an application start menu. On the menu page, there is a menu for application descriptions, learning objectives, learning materials, practice questions, and application developers. The application description menu functions to explain the researcher's objectives in creating iSpring-based learning media and what references were used to create the material. Apart from that, the application description menu also contains usage instructions which function to explain the buttons/icons contained in the application and how to use them.

The learning material menu explains the material contained in the learning media, equipped with learning videos and various animations that can attract students' interest in learning. The material contained in the learning media is the life cycle of animals and efforts to preserve living things. At the end of the learning media, it is accompanied by practice questions to train students' abilities in understanding the learning material. Practice questions in the form of multiple-choice questions accompanied by feedback for the answer key for practice questions. Several menus in I-Spring based learning media are presented in Figure 1.



Figure 1. Animal Life Cycle Material Display

Product Development Validation Data Results

The feasibility of I-Spring based learning media was obtained through validation results from several validator experts, namely media, material and learning experts. The results of the validator's assessment of the product being developed are in the form of qualitative data and descriptive quantitative data. Qualitative data in the form of suggestions and criticism from expert validators. Quantitative data was obtained based on a validation questionnaire consisting of a scale of 1 to 4.

The media validation questionnaire includes clarity of the application title, clarity of the operating guide, accuracy of color, background, type of text and font presented, suitability of the animation used, suitability of the video to the material, and presentation of an interesting narrative. Media validation involves two learning media experts. The suggestions and criticism given by media expert validators include giving the application name, application logo, class description, changing the menu order, providing the video link included, as well as changing the position and giving bright colors to several icons. These suggestions and criticisms have been followed up with revisions to learning media products. Meanwhile, the results of the quantitative aspect of I-Spring based learning media product validation are presented in Table 1.

Table 1. Media Validation Results

No	Aspect	V1	V2	Average	Criteria
1	Application Title and Initial Display	90.62%	93.75%	92.18%	Very Worth It
2	Operation and usage guide	91.67%	95.83%	93.75%	Very Worth It
3	Color, background, text type and font	88.89%	94.44%	91.67%	Very Worth It
4	Animation and Video	86.11%	91.67%	88.89%	Very Worth It
5	Narrative attractiveness	90.62%	93.75%	92.18%	Very Worth It
Average Media Validation Results				91.74%	Very Worth It

Material validation includes suitability of the material with KD and indicators, suitability of learning objectives, suitability of the material to the student's ability level, as well as effective use of language and sentences. The suggestions regarding learning media include simplifying the language so that it is easier for students to understand and adding sources to each reading contained in the media. Meanwhile, the results of material validation in quantitative aspects are presented in Table 2.

Table 2. Material Validation Results

No	Aspect	V1	V2	Average	Criteria
1	Material Suitability	90.62%	93.75%	92.18%	Very Worth It
2	Language	90.62%	94.44%	92.53%	Very Worth It
3	Media Attraction	100%	100%	100%	Very Worth It
4	Learning Independence	100%	100%	100%	Very Worth It
Average Material Validation Results				96.18%	Very Worth It

Learning Expert Validation includes suitability of learning material to Basic Competencies, Indicators and Learning Objectives, suitability of material to student abilities, and suitability of sentences and language to student abilities. The learning expert validator stated that the I-Spring based learning media product was very good and suitable for use in learning. Meanwhile, a description of the quantitative data from the learning validation results is presented in Table 3.

Table 3. Learning Expert Validation Results

No	Aspect	V1	V2	Average	Criteria
1	Conformity of Material with KD, Indicators and Objectives	86.11%	91.67%	88.89%	Very Worth It
2	Suitability of material to student abilities	95.83%	90.62%	93.22%	Very Worth It
3	Suitability of Sentences and Language	100%	100%	100%	Very Worth It
Average Learning Validation Results				94.04%	Very Worth It

The validation results of the I-Spring learning media on animal life cycle material show that the media is very suitable for use. The media validation results show a score of 91.74% with very feasible

criteria. The material validation results showed a score of 96.18% with very feasible criteria. Meanwhile, the learning expert validation results showed a score of 94.04% with very adequate criteria. Thus, I-Spring learning media on animal life cycle material is very suitable for use in learning, both in terms of media, material and learning aspects.

Product Development Attractiveness Data Results

The attractiveness of I-Spring based learning media products was obtained through questionnaires distributed to students who had used the media. An attractiveness questionnaire was distributed to all class IV students at SDN Tanjungrejo 02, Malang City. The questionnaire is in the form of a Likert scale with a score range of 1-5. The results of student responses in the form of quantitative data are presented in Table 4. The percentage of attractiveness of the development product shows a score of 90.55% with very attractive criteria. Thus, I-Spring based learning media products are very attractive to students and can facilitate the learning process.

Table 4. Percentage of Product Development Attractiveness

No	Name	Attractiveness (%)
1	A.I	83
2	A.I	97
3	ANA	91
4	AAD	100
5	AHR	80
6	APNA	100
7	ASW	94
8	ALI	91
9	AN	100
10	BOB	86
11	B.A	80
12	AND	89
13	DVN	94
14	FZZA	91
15	HFR	86
16	KAHB	89
17	MT	94
18	M.A	97
19	MHF	80
20	MNHZ	89
Average		90.55

The results of material, media and learning validation show that the I-Spring learning media on animal life cycle material is very suitable for use in learning. The material validation score shows a percentage of 91.74%, media validation is 96.18%, while learning expert validation is 94.04% with very feasible criteria. The results of student responses as users of I-Spring learning media showed a score of 90.55% with very interesting criteria. Thus, the I-Spring learning media is very suitable and interesting to use in learning.

The results of this research are in line with previous research which used I-Spring media in learning. Several previous studies used I-Spring media in the form of an Android application (Cahyawati & Yasa, 2021; Dinra et al., 2022; Handayani & Rahayu, 2020) and integrated into the Microsoft power point program (Komala, nd; Palguna et al., 2020; Rani et al., 2023). Using I-Spring media can improve the quality of learning (Irtawaty et al., 2018). Apart from that, the use of I-Spring media which is equipped with videos and animations can support cognitive abilities (Ningsih et al., 2022), critical thinking skills (Muchtart & Nasrah, 2021) and students' independent learning activities (Topano et al., 2022).

Conclusion

The material on animal life cycles and environmental conservation is one of the materials studied at elementary school level. In general, students find it difficult to learn the material, because the material is abstract. I-Spring learning media can help contextualize abstract material and increase learning effectiveness. The media validation results showed a score of 91.74%, material validation was 96.18%, while learning validation was 94.04%. Meanwhile, the attractiveness of I-Spring learning media products received a score of 90.55%. Thus, learning media is very suitable for use in supporting the effectiveness of the science learning process.

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