

Development of Interactive Web-Based Learning Media Assisted by Lectora Inspire to Improve IPAS Learning Outcomes

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Abstract: This research is motivated by the lack of technology utilization in the development of learning media at SDN Kaliwungu 02, which impacts student learning outcomes. The type of research used is Research and Development (R&D) with the ADDIE development model. This study aims to develop and test the feasibility, practicality, and effectiveness of interactive web-based learning media assisted by Lectora Inspire. The population in this study consisted of 36 children, with 12 subjects for small-scale trials and 24 children for large-scale trials. Validation results by material and media experts showed 88.5%, which falls into the feasible category. Based on pretest and posttest results, it was found that this interactive learning media is effective in improving student learning outcomes, as evidenced by the increase in the average pretest score from 62 to 83 at posttest and an N-gain test result showing a gain value of 0.77 in the high category. Based on the questionnaire responses collected, very positive feedback was obtained from both teachers and students. From these results, it can be concluded that interactive web-based learning media assisted by Lectora Inspire is effective in improving IPAS learning outcomes and is feasible and practical for use in the learning process for grade IV students at SDN Kaliwungu 02.

Keywords: Learning Outcomes; IPAS; Lectora Inspire; Interactive Learning Media; Website

Introduction

To achieve the desired learning objectives, an education curriculum is necessary. Therefore, the government issued the Minister of Education, Culture, Research, and Technology of the Republic of Indonesia Decree No. 56/M/2022 on guidelines for implementing the curriculum as part of the learning recovery process. This recovery effort transformed the 2013 curriculum into the Merdeka Curriculum. In the Merdeka Curriculum, teachers are expected to provide more freedom in learning, meaning that students are freer and more active, with teachers acting only as facilitators in the learning process. One way to achieve effective learning, the government established Minister of Education, Culture, Research, and Technology Regulation No. 7 of 2022 on content standards for Early

Childhood Education, Basic Education, and Secondary Education levels, which includes various learning contents, one of which is Science and Social Studies or IPAS. IPAS, or Science and Social Studies, is one of the subjects in the Merdeka Curriculum. The learning outcomes outlined in the Head of Standards, Curriculum, and Educational Assessment Agency Decree No. 033/H/KR/2022 on learning outcomes for early childhood education, basic education, and secondary education in the Merdeka Curriculum include, among other things, students utilizing magnetic phenomena in everyday life, demonstrating various types of forces, and their effects on the direction, movement, and shape of objects.

In reality, there are still problems at the elementary school level. According to research by Sa'i & Jinan (2022), the Merdeka Curriculum brings about changes in

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learning, requiring teachers to think more about how to successfully conduct classroom learning. The learning process in the Merdeka Curriculum involves more than just the delivery of material by the teacher; it also includes many other aspects, such as how teachers can optimize the use of media that captures students' attention (Nic et al., 2022). Learning media is a key factor in improving student learning outcomes, and teachers must optimize it as much as possible (Sujarwo et al., 2022). With the advancement of technology, teachers must adapt significantly, especially in the use of technology. Research by Istiqomah et al. (2023) and Sulistyowati et al. (2019) reveals that technology is a crucial factor in education that can be developed, particularly in developing learning media, aiming to improve the quality of students. However, the use of technology-integrated learning media has not been well-developed and is still underutilized (Irwandani et al., 2019).

Researchers at SD Negeri Kaliwungu 02 also found that teachers have not maximized the use of technology in delivering learning materials. Teachers have not optimally developed learning media that support the effectiveness of technology to improve student learning outcomes. The media used by teachers is still predominantly teacher-centered rather than promoting student activity. Facilities and resources at the school, such as computers, LCDs, and Wi-Fi, have not been utilized to their full potential. The suboptimal use of learning media affects student learning outcomes. Student learning activities tend to be passive, resulting in less satisfactory achievement of learning outcomes according to the Minimum Passing Criteria (KKM). It was found that 10 out of 18 students did not meet the KKM or 55.6%.

Referring to these issues, researchers thought of developing a learning media that would make students more active by utilizing technology. Learning media is something used to convey messages, stimulating students' thoughts, interests, attention, and feelings, thus achieving learning objectives (Nur Jannah et al., 2020). Interactive learning media is one of the tools that teachers can use to increase student engagement, as it can combine various elements such as images, audio, video, and more (Rachmadtullah et al., 2023; Sujarwo et al., 2022). Previous findings indicate that interactive learning media can be beneficial in providing innovation for teachers to improve student outcomes (Indra et al., 2021; Septiyanto et al., 2024).

Lectora Inspire is software that can be used by teachers as a learning medium (Saputro et al., 2020). Lectora Inspire can serve as a learning medium that includes teaching materials with quizzes or evaluations (Reffiane et al., 2019). One unique feature of Lectora Inspire is that it allows students to see immediately

whether their quiz answers are correct or incorrect, thus relieving teachers from the burden of grading each quiz manually (Hikmi et al., 2020). Lectora Inspire can produce various outputs, including websites, which can make learning more accessible for students and potentially increase their curiosity (Garrand, 2023).

In terms of its application in education, Lectora Inspire has been widely used as a learning medium to enhance student learning outcomes. Research by Miaz et al. (2019) and Sulistyowati et al. (2019) shows that the use of Lectora Inspire positively impacts student learning outcomes. Other studies also indicate that Lectora Inspire is a practical and effective learning medium (R. B. Kurniawan et al., 2019; Sanwidi & Swastika, 2019). Furthermore, using Lectora Inspire as a learning medium improves students' understanding (Lukman et al., 2022; Pendidikan Vokasi et al., 2018).

Based on this background, researchers conducted a study to develop interactive, website-based learning media using Lectora Inspire to improve student learning outcomes on the topic of force in the IPAS subject for fourth-grade students at SDN Kaliwungu 02. This study aims to test the feasibility of the media, its practicality, and its effectiveness as a learning tool. The development of this learning media will make it easier for students to access the material anytime and anywhere, incorporating various forms of content such as images, audio, videos, and text. The interactive learning media will also include interactive quizzes for students to complete after studying the material.

Method

The type of research used in this study is Research & Development (R&D), which aims to produce interactive, website-based learning media using the Lectora Inspire application to improve student learning outcomes on the topic of force in the IPAS subject for fourth-grade students at SDN Kaliwungu 02.

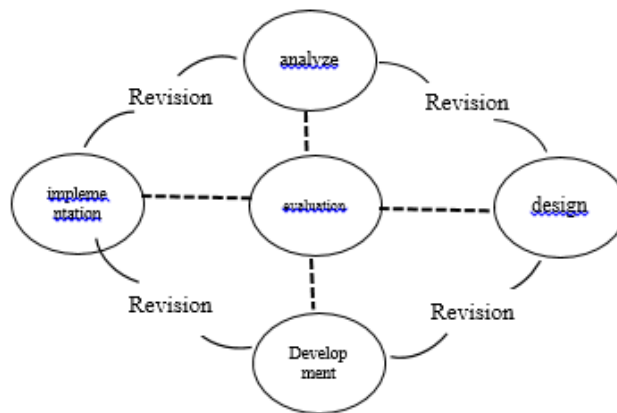


Figure 1. ADDIE Development Model

The Analysis phase was conducted to identify existing potentials and problems. Activities included pre-research through observation, interviews, and document data such as the learning outcomes of fourth-grade students at SDN Kaliwungu 02. During this phase, various problems were identified and data was collected to plan the development of a product to address these issues by distributing questionnaires to teachers and students to understand their needs. The Design phase focused on three activities: selecting materials that align with the characteristics of the students and learning objectives, determining the learning strategies to be used, and choosing appropriate evaluation methods and models. In the Development phase, information was gathered from various sources to develop the materials, such as texts, videos, audio, and other documents. During this phase, design validation and revisions were conducted. The design validation was carried out by two experts—one in content and one in media—using a validation instrument to assess the feasibility of the interactive, website-based learning media assisted by Lectora Inspire.

In the Implementation phase, the developed media was used in teaching to evaluate its attractiveness, feasibility, and effectiveness. The first trial was conducted on a small scale with 12 fifth-grade students from a population of 18 at SDN Kaliwungu 02, using purposive sampling to select a heterogeneous sample based on class rankings. After the lessons, feedback questionnaires were given to students and teachers regarding the use of the learning media in the IPAS subject on the topic of force. The final phase of the ADDIE model is Evaluation, which is comprehensive and inclusive from the first to the last stage. Key aspects of this phase include establishing criteria, tools, and conducting evaluations. The main questions address the attitudes and competencies of students during learning and their learning outcomes after using the media assisted by Lectora Inspire. This phase includes the final improvements based on feasibility and content expert validations. The data collected in this research was primary data, including both qualitative and quantitative data. Qualitative data comprised documentation, interviews, observations, and field notes from fourth-grade classes. Quantitative data included the number of students and their learning outcomes, as well as pretest and posttest scores. The research design was a pre-experimental design using a one-group pretest-posttest model to compare conditions before and after treatment (Sugiyono, 2019). Data collection techniques included tests and non-tests. The test technique involved 30 multiple-choice questions, while non-test techniques included observations, questionnaires, document data, and interviews. The feasibility of the product was assessed through data

analysis by media and content experts using a Likert scale. Practicality was assessed using questionnaires to gauge student and teacher responses after using the developed product, employing a Guttman scale. Effectiveness was tested by analyzing N-gain data based on pretest and posttest scores from a large-scale trial.

Results and Discussion

Data Analysis and Collection

Initial research revealed several issues: teachers had not maximized the use of technology and existing facilities such as WiFi, LCD projectors, and computer labs. In classroom activities, teachers had not fully utilized learning media, causing students to rely solely on worksheets. Moreover, 10 out of 18 fourth-grade students (55.6%) had not met the Minimum Competency Criteria of 67.

Subsequently, the researcher distributed questionnaires to teachers and students to determine their needs for learning tools. Data collected from these questionnaires indicated that teachers had not maximized the use of learning media to attract students' attention and motivate them. Learning media were rarely used, and existing technology in the school was not being effectively utilized.

Teachers need learning tools that utilize technology and are easy to use by the teacher himself and students. Teachers need learning media that contains teaching materials complete with images, audio, and video to increase students' interest in learning. Teachers need a learning media that provides interaction with students and can be used anywhere and anytime. Students need learning tools that are interesting and easy to use anywhere and anytime. Students agree with the use of learning media that utilizes technology during learning. Students agree with the existence of learning media that contains teaching materials complete with images, audio, and video to improve students' understanding. Students also agree that in the learning media, there are various quizzes to measure knowledge after studying the material provided.

Product Design

Interactive learning media is designed according to learning outcomes and the learning objectives to be achieved. Media was developed with the concept of teaching materials equipped with various images, audio and videos that suit the characteristics of students so that they are easy to understand. Products are made by preparing materials and creating designs using the Canva application. The results of the design will be included in learning media using the Lectora Inspire application so that it can be edited and added to the material as well as containing various images, audio,

video and quizzes. The final product will be stored on the website and will later be shared with students via a link so that an internet network is required to use it. Part of interactive learning media consists of:



Figure 2. Cover



Figure 3. Menu Options



Figure 4. Concept Maps



Figure 5. Material



Figure 6. Quiz

Products are designed using steps that include (1) preparation of materials, format, layout, or design for a design tailored to your needs; (2) creating product designs; (3) application of media in interactive learning media.

Feasibility of Website-Based Interactive Learning Media Products with the Help of Lectora Inspire Design Validation

At this stage, the researcher will carry out product validation with professional media expert validators, namely lecturers in elementary school teacher education study programs and material experts, namely lecturers in primary school teacher education in science subjects, to test the feasibility of the product. After being assessed by an expert validator, there is input regarding the product developed by the researcher so that the researcher will receive a revision of the product that has been created.

Table 1. Results of Interactive Learning Media Expert Validator Assessment

Feasibility Aspect	Validation Index (%)	Information
Page	90%	valid
Material	87%	valid

Table 1 shows that the validation results provided by the expert validator have valid results because they get a score above 80% which is included in the very appropriate criteria (Arikunto, 2018). This is in line with research (Simamora & Yogica, 2022) that the results of the validation of learning media development with the help of the Lectora Inspire application from a team of design experts had a score of 98.3% and the score obtained from material experts was 93.3%. Another research conducted by (Ulfatuzzahara, 2020) stated that the use of learning media by utilizing the Lectora Inspire application obtained a score of from media experts of 87.5% and material experts obtained a score of 92.5%. Apart from that, research conducted by (Mahliatussikah, 2021) also stated that learning media using Lectora Inspire obtained a good score from media experts and

material experts of 95% which was in the very good category.

Design Revision

Researchers then revised the design according to input from media experts and material experts. The input provided by the media expert validator is in the form of completing the cover with the academic identity and name of the supervisor, aligning the font in the media, and adjusting the background to attract students' attention. Input obtained from material experts is in the form of solving learning concept maps for lesson 1 and lesson 2 as well as adjusting material images.



Figure 7. Cover before revision



Figure 8. Cover after revision



Figure 9. Menu options before revision



Figure 10. Menu options after revision

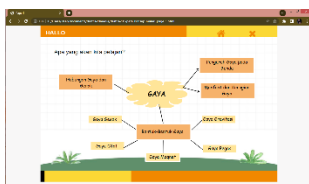


Figure 11. Concept Map Before Revision



Figure 12. Concept Map after Revision



Figure 13. Material before revision



Figure 14. Material after revision



Figure 15. Quiz Page Before Revision



Figure 16. Quiz Page After Revision



Figure 17. Quiz before revision



Figure 18. Quiz after revision

Practicality of Interactive Learning Media (Product Trial)

At the trial stage there were 12 class V students with heterogeneous selection based on the level of student ability, namely 4 students with low scores, 4 students with medium scores, and 4 students with high scores. After students carry out the learning, students and class teachers are given an answer sheet containing 16 questions on the Guttman scale which must be filled in based on their experience using the product that the researcher has developed. The questionnaire has assessment criteria: (1) very positive criteria if it has a percentage of 76%-100%, (2) positive criteria if it has a percentage of 51%-75%, (3) negative criteria if it has a percentage of 26%-50%, and (4) the criteria is very negative if it has a percentage of 0% -25%. To calculate the answers to the teacher response questionnaire are as follows (Formula 1).

$$NP = \frac{R}{SM} \times 100\% \tag{1}$$

To test the practicality of interactive learning media with the help of Lectora Inspire, a teacher and student response questionnaire was distributed which had 3 aspects, namely material, media quality, and use of language in the media.

Table 2. Results of Teacher and Student Responses to website-based interactive learning media with the help of Lectora Inspire

Respondent	Assessment	Information
Teacher	91%	Very positive
Student	90%	Very Positive

Table 2 shows that the results of the teacher and student response questionnaire to interactive learning media assisted by Lectora Inspire had very positive results because it had a score above 75% so interactive learning media assisted by Lectora Inspire was practically used to assist in learning activities. The media was stated to be very positive and practical based on 15 questions on the Guttman scale and there were no product revisions in small-scale trials.

Table 3. Results of Teacher and Student Responses to Website-Based Interactive Learning Media with the Assistance of Lectora Inspire

Respondent	Assessment	Information
Teacher	96%	Very Positive
Student	92%	Very Positive

Table 3 shows that the results of teachers' and students' responses to website-based interactive learning media with the help of Lector Insoire had very positive results because they obtained a score above 75%. This learning media was declared very positive based on 15 questions. This is in accordance with research that has previously been conducted which stated that the response questionnaire or responses of teachers and students to learning media using Lector Inspire which was developed had results above 75%, indicating that learning media had very positive results, which means it is practical to use as media. learning in the classroom (Lukman et al., 2022; Miaz et al., 2019; Mudinillah, 2019).

Effectiveness of Website-Based Learning Media Products with the Help of Lectora Inspire Trial Use

Trials carried out on a large scale using interactive website-based learning media with the help of Lectora Inspire on science and technology subjects were carried out to determine the effectiveness of the product based on student learning outcomes. The research design used was a pre-experimental design with a one-group pretest-posttest design model, namely there was a pretest before being given treatment and a posttest after being given treatment.

Table 4. Pretest and Posttest Results of Students in the Use Trial

Test Type	Average	Average Difference
Pretest	62.36	21.11
Posttest	83.47	

In table 4 it is known that the average student learning outcome score shows an increase of 21.11 in large-scale product trials. These data show that there are differences in student learning outcomes regarding style material in class IV science and science subjects at SDN Kaliwungu 02. To find out the average increase in pretest and posttest, an N-gain test was carried out by comparing the difference between SMI and pretest.

Table 5. Average Test Results (N-Gain)

Average Difference	N-gain mean	Criteria
21.11	0.77	High

Table 5 shows an average difference of 21.11 in the large-scale product trial activities. This indicates that students' learning outcomes improved by 0.77, falling into the high category. This average increase demonstrates that the use of interactive, website-based learning media assisted by Lectora Inspire successfully enhanced student learning outcomes.

This aligns with research conducted by Aldira Audia et al. (2021) and Dahlia et al. (2022), which stated that learning media assisted by Lectora Inspire could improve student learning outcomes, as evidenced by the N-gain test falling into the "high" category.

The application of learning media assisted by Lectora Inspire also enhances students' understanding of the material. Research by R. B. Kurniawan et al. (2019) and Padbal et al. (2022) both reported that this media helps students better comprehend the material presented by the teacher.

Interactive learning media can also improve students' thinking skills. This media includes various features accessible to students that can influence their creativity, thereby enhancing their Higher Order Thinking Skills (HOTS) (A. Kurniawan et al., 2023).

Data collected during the trial phase comprised the IPAS scores of students from pretests and posttests using the interactive, website-based learning media assisted by Lectora Inspire on the topic of force to determine the improvement in students' cognitive learning outcomes. The data was then subjected to hypothesis testing or a t-test using parametric statistical techniques with a paired t-test formula after using the media. The data analysis results showed a sig. value of 0.000. The test criteria using the paired sample t-test state that if the sig. (2-tailed) value is < 0.05, there is a significant difference between pretest and posttest learning outcomes, and vice versa. The calculated t-test results showed a sig. (2-tailed) value of 0.000 < 0.05, indicating a significant difference between pretest and posttest learning outcomes.

Conclusion

Based on the research results, it can be concluded that the interactive, website-based learning media assisted by Lectora Inspire can improve the learning outcomes of fourth-grade students at SDN Kaliwungu 02 on the topic of force. This is evidenced by the product validation assessment results, which averaged 88.5%, falling into the "very feasible" category. The analysis of pretest and posttest data showed an average increase of 30.06, an N-gain of 0.77 (high category), and a t-test result with a sig. (2-tailed) value < 0.05, indicating a significant difference in student learning outcomes. This proves that the interactive, website-based learning media assisted by Lectora Inspire is feasible, practical, and effective for improving the learning outcomes of fourth-grade students in the IPAS subject on force.

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Author Contributions

Dika Inayati contributed to conducting the research, developing the product, analyzing data, and writing the article. Novi Setyasto acted as the supervising lecturer throughout the research and writing activities.

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Conflicts of Interest

The authors declare no conflicts of interest.

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