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Development of Monopoly-Based Media Using Game-Based Learning to Improve Elementary School Students' Learning Outcomes

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Abstract: This research is based on the low achievement of science learning outcomes for fourth-grade students at Wonosari 03 Elementary School in Semarang City, which is caused by the lack of engaging concrete media, resulting in relatively low student activity levels, despite teachers' efforts to implement active learning models. The purpose of this study is to develop and test the feasibility and effectiveness of Monopoly media based on Game-Based Learning to improve students' cognitive science learning outcomes on flora and fauna topics in Indonesia. This research method uses a Research and Development approach with the ADDIE model, which includes analysis, design, development, implementation, and evaluation. Data collection was conducted through observation, interviews, questionnaires (including media and material expert questionnaires, as well as teacher and student questionnaires), documentation, and tests (pretest and posttest). The data analysis techniques used in this research include descriptive statistics, normality tests, paired-samples t-tests, and N-Gain tests. The results indicate that the developed media is considered highly feasible by media experts (95%) and material experts (93%). This is supported by teacher response questionnaires at 95% and student response questionnaires at 93.75%. The normality test indicates that the pre-test and post-test data are normally distributed, so a paired-samples t-test was conducted, yielding a p-value of 0.000 (< 0.05), indicating a significant difference in learning outcomes before and after the media implementation. The N-Gain test shows a value of 69.70% (moderate effectiveness). It can be concluded that the monopoly media on Game-Based Learning about the diversity of flora and fauna in Indonesia, developed, is considered very feasible and sufficiently effective in improving students' cognitive learning outcomes in grade IV IPAS at Wonosari 03 Public Elementary School in Semarang City.

Keywords: Game-Based Learning; *IPAS*; Media Monopoly.

Introduction

Education plays a strategic role in fostering and shaping the nation's character. Improving one's quality, abilities, interests, and potential talents can be pursued through the educational pathway [1], including elementary school education. The quality of education needs to be continuously improved, including enhancing learning through the use of teaching materials, strategies, media, and student worksheets, which directly impact students' learning outcomes [2]. In elementary school, the subjects of Natural Sciences and Social Studies (*IPAS*) integrate concepts from the natural and social sciences meaningfully. This learning is designed to guide students to think critically and develop skills for examining natural phenomena and their dynamics, as well as for understanding social and humanitarian aspects of daily life [3]. Several learning theories applied in *IPAS* aim to facilitate and encourage student engagement in project-based learning [4]. With an integrated approach, these two fields of knowledge are not studied separately but presented in a connected manner so that students can understand the relationship between the scientific and social aspects in real life [5].

Based on the interview results during the *IPAS* learning process, the teacher has attempted to implement active learning through the Problem-Based Learning (PBL) model, but it has not been integrated with innovative concrete learning media, which has affected the low student activity, even though efforts have been made to use a student-centered learning model. The issues with *IPAS* learning at SD Negeri Wonosari 03 in Semarang City, as revealed by the fourth-grade interview results, indicate that students' cognitive learning outcomes in *IPAS* subjects remain low. The low *IPAS* learning outcomes are caused by several problems, including a lack of concrete learning media for *IPAS*, students' difficulty in absorbing the broad scope of *IPAS* material, limited variation in learning media for the diversity of flora and fauna in Indonesia, a lack of student interest in *IPAS* lessons, and students' disinterest in participating in group work with friends.

The problem is supported by the poor performance of fourth-grade students in science, especially in material on the diversity of flora and fauna in Indonesia. This material has a broad scope because students need to recognize many types of flora and fauna in Indonesia. Additionally, students also have difficulty remembering the material taught. This results in students having low learning outcomes and difficulty understanding the diversity of flora and fauna in Indonesia. This condition is caused by the lack of engaging concrete media in the learning process. The material on Indonesia's flora and fauna diversity needs supporting media to convey it effectively.

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Based on the interview results, the media used still rarely includes concrete media. In teaching the diversity of flora and fauna in Indonesia, teachers at Wonosari 03 Public Elementary School in Semarang City have tried to provide media in the form of Quizizz quizzes. However, the use of digital media has a lesser impact on students because it cannot be used directly, and not all students can use it during lessons. The use of this media is less effective for fourth-grade students at Wonosari 03 Public Elementary School in Semarang City, as evidenced by the learning results: a Learning Success Criteria (LSC) of 70, with an average score of 69.57%, and 21 students participated. Twelve out of 21 students (57.14%) scored below the LSC, and nine (42.86%) scored above it. The learning outcome data show that most students have not yet met the mastery criteria, indicating issues with the learning process.

According to Lwin, interpersonal intelligence can be developed through several games [6]. Games in learning can be used as a medium. One interesting and innovative medium is Monopoly. An engaging learning media can attract students' attention when using that media [7]. Interesting media during learning can also increase students' active engagement both individually and in groups [8]. Learning media also has benefits for conveying information and the learning process. Proper use of learning media during the learning process will enhance their effectiveness as efficient supporting tools in achieving learning objectives [9].

Several studies have shown that Game-Based Learning (GBL) can significantly improve students' motivation, engagement, and learning outcomes compared to conventional learning [10]. GBL allows students to learn through hands-on experience, quick feedback, and fun and challenging activities [11]. In Indonesian, Game-Based Learning means game-based learning [12]. Game-based learning models offer benefits for the learning process, including increasing students' motivation and engagement, developing their abilities, providing rapid feedback, enhancing problem-solving skills and creativity, and training students to take risks during experiments [13].

Research by Lisativani Fatimah previously showed that Game-Based Learning (GBL) is a highly effective model for making learning more enjoyable, engaging, and enthusiastic than passive methods such as reading textbooks or just theory [14]. In addition, game media, both digital and non-digital, have been shown to enhance students' social interactions and cognitive abilities [15]. Another study by Nur' Aini also revealed that Game-Based Learning affects students' learning outcomes [16]. However, most research still focuses on the use of digital media, while the utilization of board games as a learning media based on GBL remains limited, especially in the context of *IPAS* learning in elementary schools.

Model Game-Based Learning has benefits in education, including increasing student motivation and engagement, developing students' abilities, providing quick feedback and progress, enhancing problem-solving skills and creativity, and training students to take risks and experiment [17]. On the other hand, some studies show that board games have advantages in creating direct interaction among students, training cooperation, and are easier to access without relying on technological devices [18]. Nevertheless, the use of board games combined with the GBL approach in *IPAS* learning, especially on the biodiversity of flora and fauna in Indonesia, remains relatively rare and has not been fully developed or studied in depth. This presents a significant opportunity to conduct further research and deepen our understanding. The integration of both media potential and the Game-Based Learning model is intended to address the problems identified in the upcoming research. Based on the identified gap, the novelty of this research lies in the development of a monopoly media board game integrated with a Game-Based Learning approach in science learning. This media is designed not only for entertainment but also as a learning tool, featuring content, interactive activities, and challenges that encourage active student engagement.

Based on the explanation provided, the researcher is interested in conducting a study titled "Development of Monopoly Media Based on Game-Based Learning on the Topic of Biodiversity of Flora and Fauna in Indonesia to Improve Learning Outcomes of Fourth Grade Students at Wonosari 03 Elementary School in Semarang City." What is interesting about this media development is that the media developed is a Monopoly game based on Game-Based Learning, which contains a series of images and engaging games, making it a learning media that can motivate and activate students. It is hoped that this can improve learning outcomes and assess the feasibility and effectiveness of the media.

Research Methods

Research and Development (R&D) is very important for developing validated products that are feasible and effective. The development of monopoly media based on Game-Based Learning follows the ADDIE development model (Analyze, Design, Development, Implementation, Evaluate), which includes the stages of analysis, design, development, implementation, and evaluation [19]. The research methodology is as follows:

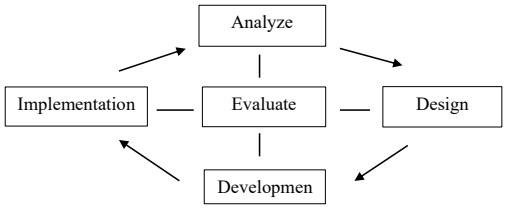

Figure 1. ADDIE Model Stages

The development of research products as learning resources begins with the analysis stage. In this stage, learning needs, student characteristics, and issues arising in *IPAS* learning are identified. The need for this research development is a monopoli-based learning media product using Game-Based Learning, driven by fundamental problems in the learning process. The design phase involved creating a monopoly media-based on Game-Based Learning tailored to the learning objectives and material. The suitability of products as teaching media in elementary schools can be assessed through several analyses. The next stage of the developed product, after the analysis phase, is the design stage for instructional media in the form of research products to be introduced to fourth-grade elementary school students. Students are assisted in

understanding the learning material through products designed to make learning more engaging and interactive. The development stage is realized by producing a monopoly media product, which is then validated by subject matter experts and media experts, followed by revisions based on their feedback. The implementation stage occurs after the media have been reviewed by media and subject matter experts and, through a revision process, applied to learning. The evaluation stage is the process of assessing the feasibility and effectiveness of the media through students' learning outcomes and users' responses during the learning process in school.

This research was conducted at Wonosari 03 Public Elementary School in Semarang City. The subjects of this study were twenty-eight students in grade IV of Wonosari 03 Public Elementary School in Semarang City. The study included the independent variable, a monopoly media-based Game-Based Learning approach, and the dependent variable, students' cognitive learning outcomes regarding the biodiversity of flora and fauna in Indonesia. Data collection techniques include test and non-test techniques. Test techniques include pretests and posttests. Before obtaining valid pretest and posttest questions, a trial run is conducted. The pretest and posttest questions tested on fifth-grade students, consisting of 19 students, totaled 50 questions. The results of the trial for the pretest and posttest questions, specifically the validity test, showed that 26 questions were valid, as determined by reliability testing and adherence to the Cronbach's alpha criterion, with a minimum value of 0.60. The reliability of the questions obtained was very high, with a reliability coefficient of 0.913. The final pretest and posttest consisted of 25 questions with good to very good discrimination power and a balanced difficulty level, including easy, medium, and difficult questions. Meanwhile, non-test techniques include observation, interviews, and questionnaires.

Data analysis techniques include product feasibility and product effectiveness. Product feasibility analysis is conducted by material and media experts, supported by questionnaires from teachers and students after using the monopoly media developed based on Game-Based Learning.

A product feasibility analysis is conducted to determine eligibility for developing a monopoly media platform based on Game-Based Learning. Feasibility is measured using expert validation questionnaires with a four-point Likert scale, ranging from very good (4) to less good (1). Product feasibility can be tested using the following formula:

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

Remarks:
NP = the percentage value being sought
R = score obtained
SM = maximum score

The percentage data will be converted according to the criteria in Table 1. Product effectiveness analysis was conducted by analyzing all data obtained from pre-tests and post-tests, preceded by a normality test, followed by data analysis using a paired sample t-test and N-Gain test to determine the final results. Data analysis was assisted by SPSS version 26.

Table 1. Product Eligibility Criteria

Percentage interval (%)	Percentage criteria
81% - 100%	Highly feasible
61% - 80%	Worthy
41% - 60%	Quite feasible
21% - 40%	Less worthy
< 20%	Not eligible

Results and Discussion

Development of Monopoly Media Based on Game-Based Learning for the Diversity of Flora and Fauna in Indonesia.

The research was conducted to examine low learning outcomes in the subject of biodiversity of flora and fauna in Indonesia at Wonosari 03 Elementary School, Semarang City. The low science learning outcomes for fourth-grade students at Wonosari 03 Elementary School, Semarang City, were due to a lack of engaging concrete media, resulting in low student activity despite the teacher's attempts to implement active learning models through Problem-Based Learning (PBL). However, its implementation was not yet optimal. This was due to the scarcity of engaging concrete media, so student activity remained low despite the teacher's efforts to apply active learning models. Based on this background, the research aimed to improve students' learning outcomes at Wonosari 03 Elementary School, Semarang City, by developing Monopoly media based on Game-Based Learning and to examine the media's feasibility and effectiveness.

This study focuses on the development, feasibility testing, and effectiveness of Monopoly media based on Game-Based Learning in the subject of Science (*IPAS*) on the material of plant and animal diversity in Indonesia for fourth-grade students at Wonosari 03 Public Elementary School in Semarang City. This research includes an assessment of the development results, including the design of the Monopoly media, its feasibility, and effectiveness, which are evaluated through pre-test and post-test scores. The steps taken in this study are described as follows:

Analyze

The development of learning media begins with observations to analyze the needs in fourth grade at Wonosari 03 Elementary School, Semarang City. The researcher's results indicate that students' learning outcomes remain low. Students need new, varied learning media. They have used digital media such as Quizizz, but the results are less effective because it cannot be used directly, and not all students can access it during lessons. Additionally, students are less interested in participating in group work with their peers. Teachers also need new media tools for learning that can serve as alternatives for teaching about the diversity of flora and fauna in Indonesia.

It is important for teachers to package learning in an enjoyable way to implement innovative teaching. Innovative works are the results of modifications, developments, or new discoveries that demonstrate teachers' contributions to

improving the quality of the learning process in schools. Additionally, these works also support the development of science, technology, education, and the arts, thereby encouraging overall progress [20]. One innovative learning media is Monopoly. The Monopoly game is adapted as an interactive learning media to support the learning process so that students can understand the material better [21]. Learning media help attract students' attention, which is a benefit of their use [22].

Design

In the design stage, it begins with outlining the scope of material based on considerations of suitability with the curriculum. The scope of material is based on the results of a needs analysis questionnaire for teachers and students. The teacher needs assessment indicates that more engaging media are needed to facilitate students' learning about flora and fauna in Indonesia. The student needs assessment indicates that students are more interested in using concrete media compared to digital media, which not all students can access. Students' cognitive levels before using the product in the study remain low. The researcher conducted a study by developing a monopoly-based media using Game-Based Learning. The design starts with the development of media, including instructional modules, teaching materials, assessment instruments, and validation sheets, all developed by experts. The scope of the material in the media is applied in two learning sessions. The first session covers the diversity of flora and fauna in Indonesia, discussing the flora and fauna of three regions and their characteristics. The second session discusses the conservation of flora and fauna in Indonesia.

Designing expert media and material validator instruments to measure the validity of the developed learning media. This development research uses questionnaires as assessment tools. Each questionnaire is prepared based on the objectives to be achieved. The instruments are then used and evaluated by media and material validators to determine the level of validity of the learning media. The evaluation of media implementation uses teachers' and students' responses to the learning media questionnaire. The questionnaire items have scores that can be compared to determine how realistic the created media is. Pretest and posttest assessments of student study results are conducted to determine learning outcomes before and after using the media.

Figure 2. Monopoly Design Assisted by Canva Application

Then design the learning media, including creating Monopoly in Canva, designing the Monopoly board, making Monopoly cards, creating Monopoly game instructions, and preparing Monopoly tokens and dice. Designing Monopoly with the Canva application makes it easier for the researcher to create media designs. Canva is an online design platform that provides a range of editing tools for creating graphic design work, including posters, brochures, and templates. The researcher uses Canva to design the Monopoly board, Monopoly cards, and game instructions.

In the Monopoly game, cards featuring flora and fauna from the three regions of Indonesia and their characteristics include flora and fauna information cards, action cards, and quiz cards. Below is the design of the monopoly media cards.

Figure 3. Monopoly Media Card Design 1

In the Monopoly game, cards on flora and fauna conservation in Indonesia include conservation, action, and quiz cards. Here is the design of the Monopoly media cards:

Figure 4. Monopoly Media Card Design 2

The final result of the monopoly design stage in the Canva application produces a monopoly design, game cards, and game instructions.

Development

The development stage involves producing the product before validation by media and material experts. During the product development stage, a banner measuring 80 cm x 80 cm is printed. The game cards are printed on ivory paper measuring 8 cm x 8 cm. The product is then tested by media and material validation experts before being implemented in schools. Validity testing is conducted by media expert lecturers and material expert lecturers. This aims to determine whether the developed monopoly media product is valid, based on the validity of the media and materials developed, by testing its feasibility.

Figure 5. Monopoly Media

Feasibility of a Monopoly Media Based on Game-Based Learning for the Diversity of Flora and Fauna in Indonesia.

The first validity test was conducted by subject-matter experts. In the validity assessment questionnaire, there are 15 questions, each with a rating scale from 1 to 4. The average score across various aspects was 93%, placing it in the 'very feasible' category. This indicates that the media is considered valid and highly suitable for use, provided it receives input and suggestions from subject-matter expert lecturers and that revisions are made in accordance with those suggestions. The validation results assessed by subject matter experts can be explained by several aspects. Based on the experts' evaluation, most aspects received a score of 4, categorized as very good. The assessment aspects include the suitability of the material with learning outcomes, learning objectives, student development, the appropriateness of the material on the game cards, the media's ability to increase students' knowledge, the sequence of the material, the alignment of the material with the images, the appropriateness and clarity of the quiz cards with the material, clarity of the material, and the ability of the material to motivate media users. Aspects scored with a 3, categorized as good, include the appropriateness of language in delivering the material, the difficulty level of the material adjusted to students' abilities, the material on the media as preparation for learning the next material, and the completeness of the material on the media and monopoly cards. The expert notes on the developed media indicate that it is good and suitable for use in the research.

The validation score results are as follows:

$$\text{Percent value searched} = \frac{56}{60} \text{ x } 100\% = 93\%$$

The suggestions from the subject matter experts are as follows:

1) In the evaluation question grid for meeting 2, the question indicator from the word 'conversation' was changed to 'conservation'.
2) In the evaluation section, the sequence of numbers in the answers can be ordered correctly.
3) In question number 42 of the pretest-posttest section, all the correct answer choices are replaced with other options.
4) The teaching materials do not yet have a concept map; a concept map of the material can be added. The addition of the concept map, as suggested by the subject matter expert, is shown in the following image:

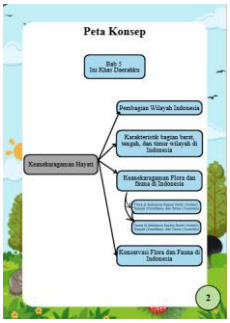

Figure 6. Concept Map

Note: Figure 6. Addition of concept maps according to the subject matter expert's suggestions

The researchers have revised the suggestions from the subject matter experts in accordance with the provided recommendations and based on the results of the revisions. The changes to the material after revision, based on the suggestions, aim to develop and test the media for feasibility. The final review results by the subject matter experts after the revisions have confirmed that the media can now be used in accordance with the development research.

The validity assessment was conducted by competent, skilled, and experienced media experts. The validation questionnaire contained 15 questions with a rating scale of 1 to 4 per item, achieving a 95% percentage with the criterion of 'very feasible.' The detailed validation results from the subject-matter expert lecturers can be viewed from several perspectives. Based on the evaluation by the content experts, most aspects received a score of 4, categorized as very good. These aspects include the color combination design, media layout, clarity of writing, font selection, image selection, proportion of image and text layout, font size, appropriateness of images in increasing student motivation, media color combinations, completeness of instructions and game cards, attractiveness of media design, accuracy of image placement, and suitability of media for group play. Furthermore, aspects that received a score of 3, categorized as good, include the appealing color combination of the media for students, an attractive Monopoly media display, and the completeness of media components. The media expert's notes include preparing a cardboard cover for the Monopoly media and providing an additional information card containing learning achievements, learning objectives, and instructions.

The results of the media validation scores are as follows:

$$\text{Percent value searched} = \frac{57}{60} \text{ x } 100\% = 95\%$$

Here are the media expert's suggestions:

1. Prepare the box for wrapping the Monopoly media
2. Provide an additional card containing learning achievements, learning objectives, and instructions.

The researcher has revised the advice from the media expert based on the input provided and the media expert's revision

results. The media changes after the revision according to the suggestions are presented in the following Table 2.

Table 2. Revised According to Media Expert's Advice

No	Sebelum revisi	Sesudah revisi
1.	Prepare the box for wrapping the Monopoly media	
2.	Provide an additional information card containing learning achievements, learning objectives, and instructions.	

The final review results by media experts after revisions have confirmed that the media can now be used in accordance with the development research.

The Effectiveness of Monopoly Media Based on Game-Based Learning for the Material of Biodiversity of Flora and Fauna in Indonesia to Improve Fourth Grade Student Learning Outcomes

Implementasion

Limited trial with 8 fourth-grade students at SDN Wonosari 03 in Semarang City. The trial was conducted by students, using media based on the Monopoly game to teach about Indonesia's biodiversity of flora and fauna. The limited trial data yielded some results.

The results of measuring students' abilities before and after the use of monopoly media. Students' abilities were assessed using a pre-test and post-test comprising 25 multiple-choice questions. The pre-test and post-test data involved only 8 students. The purpose of administering the pre-test and post-test was to observe students' abilities before and after using monopoly media. Below is the research results in Figure 7.

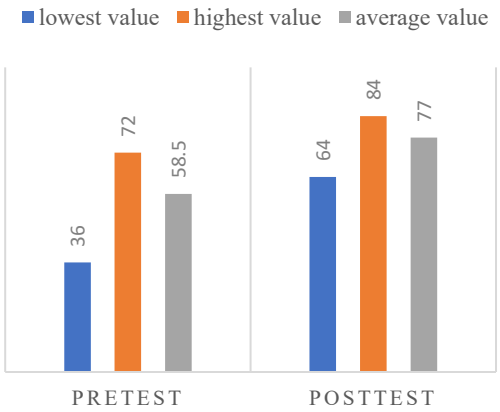

Figure 7. Descriptive Test Chart of Limited Data

Descriptive test: the students' average pretest score on the limited trial was 58.50, with a minimum of 36 and a maximum of 72. After implementing Monopoly media based on Game-Based Learning, the posttest average score increased to 77.00, with a low of 64 and a high of 84.

Tabel 3. Hasil Beberapa Uji Data Terbatas

	Normality test	Paired Sample t-test	N-Gain Test
Limited pretest data	0.454	0.001	0.4356 (43.56%)
Limited posttest data	0.202		

Limited data indicate that the Shapiro–Wilk test yielded p-values of 0.454 for the pretest and 0.202 for the posttest. Since both values are greater than 0.05, the pretest and posttest data are normally distributed. Based on the available data, the paired sample t-test shows a significance value (2-tailed) of 0.001 (<0.05). This means there is a significant difference in students' learning outcomes before and after using Game-Based Learning-based Monopoly media. Additionally, the N-gain test result of 0.4356 falls within the moderate range, indicating an improvement in learning outcomes after implementing the learning process, with an N-Gain value of 43.56%.

The media monopoly was tested on a limited basis in fourth grade. The students' responses to learning activities using the monopoly media were observed through a 10-item response questionnaire, with a rating scale of 1 to 4 for each item. The four rating points are: 4 for very good, 3 for good, 2 for enough, and 1 for lacking. The average score across all assessment aspects was 93.75%.

Next, the broad trial was conducted by directly applying the monopoly media. The broad trial was tested on 20 fourth-grade students at SDN Wonosari 03 in Semarang City. The trial was carried out by students, using monopoly media based on Game-Based Learning on the topic of biodiversity of flora and fauna in Indonesia. The broad trial measured students' abilities before and after using the monopoly media. Students' abilities were assessed using a pretest and a posttest comprising 25 multiple-choice items. The pretest and posttest questions had limited data, involving 20 students. The purpose of the pretest and posttest was to determine students' abilities before and after using the monopoly media. The data from the pretest and posttest were obtained from several tests. Below is a table of the results from some of the broad trials:

Table 4. Descriptive Test Results

Aspects	Pretest	Posttest	Remarks
mean	48.6	85	rose 36.40 points
minimum value	28	72	sharp increase
maximum value	68	96	increased
standard deviation	11.482	6.473	more evenly distributed

The following is a graph of the descriptive test results for the area data:

Figure 8. Descriptive Test Chart of Area Data

The results of the descriptive statistical analysis show that the students' average pretest score on the broad trial was 48.60, with a minimum of 28 and a maximum of 68. After using Monopoly media based on Game-Based Learning, the average posttest score increased to 85.00, with a low of 72 and a high of 96. This indicates a significant improvement in students' learning outcomes after using the learning media.

Table 5. Normality Test Results Using SPSS

Shapiro-Wilk	Sig. value	Information
Pre-test	0.728	Normal
Post-test	0.427	Normal

The Shapiro–Wilk normality test showed p-values of 0.728 for the pretest data and 0.427 for the posttest data. Both values are greater than 0.05, indicating that the pretest and posttest data in the trial are normally distributed. Therefore, the next hypothesis test will use a paired-samples t-test.

Table 6. Paired Sample T-test Results

	Mean difference	t hitung	df	Sig. (2-tailed)
Pretes Posttest	-36.400	-12.945	19	0.000

From the test results, the significance value (2-tailed) of 0.000 (<0.05) indicates a substantial difference between students' learning outcomes before and after using Monopoly media based on Game-Based Learning. Therefore, the Monopoly media based on Game-Based Learning has proven very effective in improving students' learning outcomes in large-scale trials.

Table 7. N-Gain Test Results

	N	Min.	Max.	Mean	Std. Deviation
N-Gain score	20	0.53	0.94	0.6971	0.12923
N-gain persen	20	53.33	94.44	69.7074	12.92299

Based on the test results, an N-Gain value of 0.6971 was obtained, which falls within the moderate range, indicating an improvement in students' learning outcomes after implementing the learning process. Meanwhile, the N-Gain percentage value of 69.70% is considered quite effective. In the broad trial, there were no teacher and student response questionnaires because the limited trial showed effective results, and the involved teachers were the same, with no suggestions from either teachers or students in the previous response questionnaires.

The research results show that the N-Gain value increases across both limited and extensive research. Limited data: the N-Gain value is 43.56% for extensive data; the N-Gain value is 69.70%. From these results, the Monopoly media developed using Game-Based Learning is effective in improving students' learning outcomes. Factors that cause the increase in learning outcomes using Monopoly media based on Game-Based Learning, include the Monopoly media being very attractive in terms of color and images. Additionally, the Monopoly media covers material on the diversity of flora and fauna in Indonesia. The use of Monopoly media in activities makes students highly interested in learning about Indonesia's diverse flora and fauna. Students' interest in the Monopoly media leads them to indirectly learn about the diversity of flora and fauna in Indonesia through play. Through activities using Monopoly media, students become more knowledgeable about Indonesia's flora and fauna, including their characteristics and conservation efforts. These factors lead to improved student learning outcomes when using Monopoly media based on Game-Based Learning. This improvement is inseparable from the media's characteristic combination of play and learning, thereby creating a more meaningful learning experience. Theoretically, this finding aligns with constructivist theory, which states that knowledge is actively constructed by students through learning experiences [23]. In this context, monopoly media provides students with opportunities to learn through play activities, group discussions, and problem-solving found in the game cards. This is also supported by engagement theory, which emphasizes the importance of students' active participation in improving learning outcomes [24].

Research results show that GBL can enhance students' motivation, engagement, and learning outcomes. Compared to previous research that primarily used digital media, this study shows that board games like Monopoly are also effective as a learning medium. In fact, the use of non-digital media has advantages, including increased direct student interaction, group collaboration, and social engagement in learning [25]. This finding also shows a contribution of novelty compared to previous research, namely the integration of the Monopoly game as a concrete media with a Game-Based Learning approach in *IPAS* learning. This media serves not only as a visual aid but also as an interactive learning tool that integrates students' cognitive, affective, and social aspects.

Evaluation

The evaluation stage is conducted to gather data deficiencies before the implementation stage. The evaluation process involves assessments by subject matter experts and media experts, along with suggestions and input for the media to be used. After evaluations by subject-matter and media experts, assessments are also conducted by teachers and students to determine the effectiveness of the media in learning. The effectiveness of the product is based on data analysis obtained during the research, which serves as the

researcher's evaluation, namely, limited media production. This study has limitations in the number of samples and the scope of implementation, which is still limited to one school. Future research evaluations can be conducted with more media production to be applied to a larger number of students. Therefore, it is recommended that future studies test the media's effectiveness on a broader scale and develop additional game-based media variations.

Conclusion

Based on the development research conducted using the ADDIE model, this study developed a monopoly media based on Game-Based Learning on the topic of flora and fauna diversity in Indonesia, which was found highly feasible and effective in improving students' cognitive learning outcomes. The research shows that integrating board games with the Game-Based Learning approach can create a more interactive, engaging, and meaningful learning experience for elementary school students. The research results indicate that the monopoly learning media is considered highly valid by subject matter experts (93%) and media experts (95%), supported by survey responses from teachers and students who rated the media as very good (95% and 93.75%, respectively). The monopoly media has been shown to effectively improve students' learning outcomes, as demonstrated by the paired-samples t-test, which yielded a p-value of 0.000 (<0.05). Therefore, the alternative hypothesis (Ha) is accepted, and the null hypothesis (Ho) is rejected, indicating a significant difference between the learning outcomes before and after the implementation of the media. The N-Gain test shows a value of 69.70% (moderate effectiveness). This means that the use of monopoly media based on Game-Based Learning for the topic of plant and animal diversity in Indonesia is highly effective in improving fourth-grade students' cognitive learning outcomes in *IPAS* at Wonosari 03 Elementary School, Semarang City. This research also shows that teachers in *IPAS* learning can use monopoly media as an innovative alternative to increase student engagement and understanding, especially for complex topics. Additionally, the use of game-based media can support student-centered learning and develop teamwork and critical thinking skills. Future research is expected to implement the media on a larger scale, develop variations of digital or hybrid media, and compare their effectiveness with other learning media to strengthen findings and contributions in the development of *IPAS* learning in elementary schools.

Author's Contribution

N.N. Afifah: Conceptualization, methodology, investigation, data collection, data analysis, media development, writing, original draft preparation. D.N. Tyas: Supervision, conceptualization, validation, data interpretation.

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