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DEVELOPMENT OF SMART SPIN BOARD LEARNING MEDIA TO IMPROVE STUDENTS' CONCEPTUAL UNDERSTANDING IN MATHEMATICS LEARNING IN GRADE 2 OF CIBATU 02 ELEMENTARY SCHOOL

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Abstract

This research was motivated by the limited learning media used, which were not fully able to capture the interest of all students, resulting in suboptimal engagement. This impacted students' conceptual understanding in mathematics learning, as the process of building conceptual understanding requires active involvement and full concentration. This study aimed to develop a smart spin board learning medium to improve students' conceptual understanding in mathematics learning. This research was conducted at SDN Cibatu 02 in 2025. The research method used was a research and development approach with the ADDIE model, which consists of five stages: (1) Analysis, (2) Design, (3) Development, (4) Implementation, and (5) Evaluation. Validation of the smart spin board was conducted by validators consisting of media experts, language experts, and material experts. The Spin Smartboard was implemented using a purposive sampling technique with 42 second-grade students as research subjects. The results showed that the product validity test was declared valid for use, with 96% of media experts, 100% of language experts, and 90% of material experts categorizing it as very suitable. Therefore, it can be concluded that the learning media is suitable for use and is practical and effective in improving students' conceptual understanding in mathematics

Keywords: Spin Smartboard, Mathematics, Conceptual Understanding.

Abstrak

Penelitian ini dilatarbelakangi oleh minimnya media pembelajaran yang digunakan belum sepenuhnya mampu menarik minat semua siswa sehingga keterlibatan mereka belum optimal. Hal ini berdampak pada pemahaman konsep siswa pada pembelajaran matematika, karena proses membangun pemahaman konsep membutuhkan keterlibatan aktif dan konsentrasi penuh. Penelitian ini bertujuan untuk mengembangkan media pembelajaran papan pintar spin untuk meningkatkan pemahaman konsep siswa pada pembelajaran matematika. Penelitian ini dilaksanakan di SDN Cibatu 02 pada tahun 2025. Metode dalam penelitian ini menggunakan metode penelitian dan pengembangan dengan model ADDIE yang terdiri dari lima tahapan yaitu: (1) Analysis, (2) Design, (3) Development, (4) Implementation, (5) Evaluation. Validasi papan pintar spin dilakukan oleh validator ahli media, ahli bahasa dan ahli materi. Papan pintar spin diimplementasikan menggunakan teknik purposive sampling dengan subjek penelitian berjumlah 42 siswa kelas 2. Hasil penelitian menunjukkan bahwa uji validitas produk dinyatakan valid untuk dipergunakan dengan presentase ahli media 96%, ahli bahasa 100%, dan ahli materi 90% kategori sangat layak, sehingga dapat disimpulkan bahwa media pembelajaran sudah layak untuk digunakan serta praktis dan efektif dalam meningkatkan pemahaman konsep siswa pada pembelajaran matematika.

Kata Kunci: : Papan Pintar Spin, Matematika, Pemahaman Konsep

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INTRODUCTION

Conceptual understanding refers to a learner's ability to comprehend the material provided, articulate that understanding in their own words, and apply it to solve problems during the learning process. Conceptual understanding is crucial in mathematics; according to Zulkardi (cited in Teguh Wibowo Fadzilah, 2015), mathematics emphasizes concepts, meaning that students must first grasp mathematical concepts to solve assigned problems and apply their learning to real-life situations. Sudaryono (2012) defines understanding as the ability to grasp the meaning and significance of studied material and then express it by outlining the core content of a text or converting data from one form to another (Musa et al., 2024).

A solid grasp of concepts fosters long-term retention, enabling students to connect one concept with another (Barokah, 2024). Addressing these issues, the researcher intends to implement an instructional tool known as the "Smart Spin Board." This tool serves as an alternative solution to student challenges, particularly regarding suboptimal learning outcomes. Designed for mathematics instruction, the tool aims to make learning more effective and improve student achievement.

The use of instructional media (including teaching aids) is essential in lower-grade elementary classrooms, as it aligns with children's cognitive development stages. Utilizing media that operates on a "play-while-learning" approach allows students to internalize material through tangible, visible facts, thereby making it easier for them to comprehend the concepts presented (Setiowati, 2023).

Instructional media plays a vital role in classroom learning activities. Such media encourages active student participation in mathematics lessons and helps enhance arithmetic skills. Mathematics education at the elementary level is crucial for establishing a foundation in logical understanding and critical thinking; however, in practice, the teaching process often faces challenges that impact the effective achievement of learning objectives. Observations and interviews with a second-grade teacher at SDN Cibat 02 who has 14 years of teaching experience reveal that despite the implementation of the *Kurikulum Merdeka* (Independent Curriculum), the teaching process still faces challenges. These include difficulties with classroom management and the delivery of material, which students sometimes find boring.

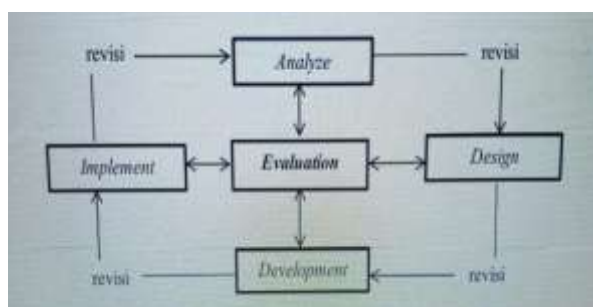
With a class size of 42 students, there is a wide range of interests and levels of focus; while some students are enthusiastic, many others lack attention and engage in joking around during lessons. The teacher has attempted to use various methods—such as discussions, projects, and question-and-answer sessions—and has utilized media like textbooks, instructional videos, and projectors. However, the media employed have not fully succeeded in capturing every student's interest, resulting in suboptimal engagement. This impacts students' understanding of mathematical concepts, as building such understanding requires active participation and full concentration. Low engagement among some students prevents the material from being fully absorbed, leading to disparities in conceptual understanding across the class. To address these

issues, the teacher has taken the initiative to incorporate engaging instructional media and educational games to boost student enthusiasm for learning mathematics. This highlights the need to develop innovative and interactive instructional media that foster a more enjoyable and effective learning process. Specifically, there is a need for more interactive and appealing tools—such as a "Spin Smart Board"—designed to enhance learning motivation and help students grasp mathematical concepts more deeply.

Given this situation, there is a need to develop instructional media that can improve students' conceptual understanding while creating a more enjoyable learning atmosphere. One potential solution is the development of game-based media, such as the Spin Smart Board, designed to foster student interest and active engagement in understanding basic mathematical concepts. This medium is expected to help improve the conceptual understanding of second-grade students. The objective of this research is to develop the Spin Smart Board to enhance the arithmetic conceptual understanding of second-grade students at SDN Cibat 02.

METHOD

This study employs the Research and Development (R&D) approach to develop "spin smart board" media, utilizing the ADDIE research design model, which comprises the following stages: (1) analysis, (2) design, (3) development, (4) implementation, and (5) evaluation.



Picture 1. ADDIE Model (Hidayat & Nizar, 2021)

This research was conducted at SDN Cibat 02, specifically with second-grade students at the school located at Jalan Hasanudin, Cibat, South Cikarang, Bekasi Regency, West Java 17530. The researcher conducted observations and interviews with both teachers and students. These observations and interviews revealed issues regarding the learning process: lessons were perceived as boring, and student engagement during mathematics instruction varied significantly—ranging from students who were genuinely interested to those who lacked focus and engaged in joking around during class activities. Although the teacher had attempted to use various instructional media, student engagement remained suboptimal because the existing media failed to fully capture the interest of all students; consequently, there was a need for instructional media capable of enhancing students' conceptual understanding—specifically, a "spin smart board."

Data collection techniques refer to the methods employed by researchers to gather research data (Waruwu, 2024). According to Sugiyono (2018), data collection techniques constitute a strategic step in research aimed at obtaining accurate and relevant information. The data collection techniques used in this research on the development of the "spin smart board" instructional medium included interviews, validation sheets, documentation, and questionnaires. The instruments employed served to assess the feasibility of the instructional

medium and to validate the developed product. Before conducting product trials, it was necessary to assess the feasibility of the smart board medium to determine its suitability level. The feasibility of the "spin smart board" is calculated using the following formula:

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

Source: (Marlinda et al., 2023)

Note:

P = Feasibility percentage

$\sum x$ = Total sum of validator scores

$\sum xi$ = Sum of maximum possible scores

100% = Constant

The calculated percentage is converted and subsequently used to determine the feasibility of the learning media. The feasibility categories are shown in the following table:

Table 1. Learning Media Feasibility Categories

No.	Percentage	Feasibility Level
1.	≤ 20	Highly unfeasible
2.	21% – 40%	Unfeasible
3.	41% – 60%	Moderately feasible
4.	61% – 80%	Feasible
5.	81% – 100%	Highly feasible

Based on the criteria above, the media is deemed suitable if it meets an achievement threshold of 61% to 100% across all elements included in the assessment questionnaires for media, subject matter, and language experts. The assessment must meet the suitability criteria; if the media is deemed unsuitable, revisions must be made until the suitability criteria are met.

In addition to assessing suitability, a practicality test for the "spin smart board" media was conducted using teacher and student response questionnaires. These questionnaires were used to evaluate the practicality of the spin smart board as a learning aid for teaching place value in mathematics. The questionnaires were administered upon the completion of the lesson. The resulting data were calculated using the following practicality formula:

$$\text{Valid/Practical} = \frac{\text{sum of all scores}}{\text{maximum score}} \times 100\%$$

After obtaining the results—with percentages determined based on the validation criteria presented in the following table:

Table 2. Practicality Criteria

Score Interval	Criteria
81%–100%	Highly Valid / Practical
61%–80%	Valid / Practical
41%–60%	Moderately Valid / Practical

Low Validity / Practicality	
21%–40%	
Invalid / Impractical	
0%–20%	
Table 3. Effectiveness Criteria	
Interval	Criteria
High / Highly Effective	
$g \geq 0.7$	
Moderate / Moderately Effective	
$0.3 \leq g < 0.7$	
Low / Less Effective	
$g < 0.3$	

Based on the table above, the established quality standard is an interval of $g \geq 0.7$ across all items included in the pretest and posttest questionnaires. The assessment must meet the "Effective" criterion; if the result falls under the "Ineffective" criterion, revisions must be made until the "Effective" criterion is achieved.

RESULTS AND DISCUSSION

Results

The following are the results of the research and development of the Spin Smartboard learning media for second-grade elementary school mathematics.

1. Design for the Development of the Spin Smartboard Learning Media

The design for the development of the Spin Smartboard learning media in this study used the ADDIE model with five stages, as follows:

a. Analysis Stage

This stage is the initial step in the research and development process for learning media. This analysis stage consists of:

1) Needs Analysis

This analysis aims to identify the causes of problems that occur during the mathematics learning process, specifically regarding place value. The development of the Spin Smartboard media was based on the needs of teachers and students at the school. This needs analysis was conducted by interviewing second-grade teachers at Cibat 02 Elementary School.

The results of the interviews with second-grade teachers at Cibat 02 Elementary School revealed that students sometimes found their classroom management and material delivery boring. Students' conditions during mathematics lessons varied widely. Some students showed interest, but many lacked focus and joked around during the learning process. Teachers have attempted to implement various learning models such as discussions, projects, and Q&A sessions, as well as using media such as books, instructional videos, and projectors. However, student engagement was not optimal because the media used was not fully engaging.

2) Curriculum Analysis

This analysis was conducted by reviewing the applicable curriculum, the Merdeka Curriculum, to ensure that the media developed aligned with the learning outcomes and objectives of mathematics, specifically the topic of number and place value, in grade 2 at SDN Cibatu 02.

Observations revealed that the media used, while aligned with the Merdeka Curriculum, were still suboptimal in learning, making it more boring for students. Therefore, researchers developed a smart spin board for grade 2 at SDN Cibatu 02 to enhance student engagement and reduce boredom. This tool provides students with opportunities to learn through hands-on experiences, such as spinning a spinner, matching numbers with their place values, and completing simple tasks using a game approach.

3) Learning Media Analysis

In this analysis, researchers observed and reviewed various learning media previously used, specifically in mathematics lessons on place value in grade 2 at SDN Cibatu 02. The goal was to identify the types of media used by teachers, their effectiveness in fostering student understanding, and any weaknesses encountered in the field.

Based on observations and interviews with grade 2 teachers at SDN Cibatu 02, it was discovered that the learning media frequently used were still suboptimal, such as projectors, textbooks, and instructional videos. Although these media assisted learning, students tended to become bored and less active due to the monotonous and less interactive nature of the media used.

Furthermore, some students had difficulty understanding the concept of place value because the material delivery did not fully accommodate the learning styles of early childhood, which require playful, visual, and manipulative approaches. Teachers also reported that there were no innovative learning media specifically designed to foster understanding of place value through engaging and fun activities.

From this analysis, the researcher concluded the need to develop more interactive, enjoyable, and user-friendly learning media for second-grade students at SDN Cibatu 02. Therefore, the spin smartboard was developed, which combines game elements with the concept of place value. This is expected to improve students' conceptual understanding and increase their interest in learning, while also helping them grasp the material more easily.

b. Design Stage

In this design stage, the researcher began designing the product to be developed to align with the learning objectives and characteristics of second-grade students at SDN Cibatu 02. The steps in the design stage are as follows:

1) Product Design

In this stage, the researcher designed the initial form of the spin smartboard learning media product to be developed at SDN Cibatu 02. The media design was carried out by considering student needs, analysis results, and indicators of conceptual understanding. This initial design

included the physical design concept of the media, the materials to be implemented, how the media works, and other supporting components.

2) Designing learning materials

The next step involves designing learning materials, including teaching modules, student worksheets, and other assessment instruments. These materials are designed to facilitate a smooth learning process through the use of the "spin smart board" medium.

3) Designing the spin smart board medium

The design of this medium is tailored for both individual and group use, making the learning experience more active and enjoyable.

The product specifications are as follows:

- a) The spin smart board is designed for use by teachers during the learning process in elementary schools.
- b) The developed spin smart board is an educational game consisting of a square wooden board with a magnetic surface, equipped with magnetic numbers and other decorative elements.
- c) The game is designed to teach number place value concepts. Students spin the board and then place the resulting numbers into the corresponding place value slots.
- d) Students can use the spin smart board to get introduced to the subject matter, thereby fostering a better understanding of the material.
- e) The spin smart board features numbers, designs, and colors aligned with the lesson theme to stimulate student interest in learning.
- f) The spin smart board measures 60×80 cm.

The visual appearance of the spin smart board is as follows:

a) Spin smart board medium



Figure 1. Spin smart board medium

b) Spin smart board guidebook section



Figure 3. Author's biography

After designing the "Spin Smart Board" media, the next stage involves developing the actual product. At this stage, the "Spin Smart Board" exists as a tangible product. The media has undergone a validation process involving a media expert, a linguist, and a subject matter expert.

d. Implementation Stage

Before instruction began, students took a pre-test to measure their initial knowledge of the material. During the lesson, students engaged with the material using the "Spin Smart Board" media in conjunction with prepared student worksheets (LKPD). Following the media-assisted lesson, students took a post-test to measure improvements in conceptual understanding after using the "Spin Smart Board." Subsequently, the researcher distributed questionnaires to gather teacher and student feedback regarding the media.

The evaluation stage marks the final phase of the "Spin Smart Board" research and development process. This evaluation aims to refine the media and assess the quality, feasibility, and

effectiveness of the media developed and implemented in the classroom. Evaluation at this stage involves measuring conceptual understanding by comparing learning outcomes between lessons that did not use the "Spin Smart Board" and those that did. Assessment results were derived from pre-test and post-test data.

2. Feasibility of the "Spin Smart Board" Media

The feasibility of the "Spin Smart Board" media was determined through a validation process involving three experts: a media expert, a subject matter expert, and a linguist. This process aimed to assess the extent to which the developed media met feasibility standards prior to its use in the learning process. a) Media expert validation

Media expert validation was conducted by Mr. Ahmad Fauzi, S.Pd., M.Pd., a lecturer at Universitas Pelita Bangsa, on June 15, 2025. Based on the validation results, it can be concluded that the media expert validation yielded a score of 96%, indicating that the media's design and functionality meet the criteria for being highly suitable for use. The media expert's feedback, comprising criticisms and suggestions, noted that "the learning media is engaging and easy to understand."

b) Language expert validation

Language expert validation was conducted by Ms. Santi Kurnia, S.Pd., M.Pd., a lecturer at Universitas Pelita Bangsa, on June 15, 2025. Based on the validation results, it can be concluded that the language expert validation yielded a score of 100%, indicating that the media and the guidebook for the "Spin Smart Board" meet the criteria for being highly suitable for use. The language expert's feedback, comprising criticisms and suggestions, noted that "overall, everything is excellent; please refine the specific points that were evaluated."

c) Subject matter expert validation

Subject matter expert validation was conducted by Ms. Rini Andriani, S.Pd., a teacher at SDN Cibatu 02, on June 15, 2025. Based on the validation results, it can be concluded that the subject matter expert validation yielded a score of 90%, placing it in the "Highly Suitable" category; thus, the "Spin Smart Board" is considered highly suitable for use as a learning medium to improve students' conceptual understanding of place value in Grade 2 at SDN Cibatu 02. The subject matter expert's feedback, comprising criticisms and suggestions, noted that "in my opinion, the instructional media is excellent because it aligns well with the subject matter." The suggestion is that even more innovative learning media could be created.

3. Improvement of Students' Conceptual Understanding

The improvement in students' conceptual understanding following the use of the "smart spin board" media was analyzed based on pretest and posttest results, N-Gain scores, and teacher and student responses to the media's implementation. These results demonstrate the extent of the media's effectiveness in helping students grasp the concept of place value.

Based on the calculation of pretest and posttest scores for 42 students—using an assessment comprising 15 essay questions—the total pretest score was 2,679, while the total posttest score was 3,761. Assuming an ideal score of 100 per student, the total ideal score is 4,200. The calculation yielded a Normalized Gain (N-Gain) value of 0.71, which falls into the high (or highly effective) category. Thus, it can be concluded that the learning media.

Based on the results of the teacher response questionnaire regarding the developed "Spin Smart Board" (*papan pintar spin*) media, a 96% rating was achieved. These results indicate that the Spin Smart Board learning medium is highly practical to use.

a. Field trial

This field trial involved 42 second-grade students from SDN Cibatu 02. The trial data revealed that student response to the Spin Smart Board achieved a score of 93%, placing it in the "Highly Practical" category. This demonstrates that the developed learning medium is well-liked, easy to use, and effective in helping students understand the concept of place value.

Discussion

1. Feasibility of the Spin Smart Board Media

The feasibility of the Spin Smart Board media was determined based on validation conducted by media, language, and subject-matter experts. This validation process aimed to assess the extent to which the developed media met feasibility criteria in terms of visual appearance, language use, and the accuracy and suitability of the learning content presented.

The validation results showed that the media expert awarded a score of 96%, the language expert awarded 100%, and the subject-matter expert awarded 90%. The average validation score across the three expert assessments was therefore 95%. Based on the predetermined feasibility criteria, this percentage falls within the **highly feasible** category. These results indicate that the Spin Smart Board media meets the required standards in terms of media design, linguistic appropriateness, and content quality.

The results of the media expert validation are supported by Ginting et al. (2024), who reported a media expert validation percentage of 87.5% out of a maximum score of 100%. In comparison, the present study conducted at SDN Cibatu 02 obtained a higher media expert validation score of 96%. This finding indicates that the Spin Smart Board learning media has a very high level of validity in terms of its visual design, presentation, functionality, and overall suitability as an instructional medium.

The language validation results are also consistent with the findings of Sari and Fatimah (2024). Their study reported that the Papapin learning media obtained a total score of 40, corresponding to a percentage of 88%, which was categorized as highly valid. According to their feasibility criteria, a percentage ranging from 81% to 100% is considered highly feasible. In the present study, the language expert awarded a score of 100%. This result demonstrates that the language used in the Spin Smart Board media is highly appropriate in terms of clarity, readability, sentence structure, vocabulary, and suitability for elementary school students. Therefore, from a linguistic perspective, the media can be categorized as highly valid.

The subject-matter validation results are similarly supported by Ginting et al. (2024), whose study obtained a material expert validation score of 90% and categorized the developed learning media as highly valid. The present study obtained the same percentage, with the subject-matter expert awarding a score of 90%. This result suggests that the mathematical content incorporated into the Spin Smart Board is accurate, relevant to the intended learning objectives, and

appropriate for the characteristics and cognitive level of elementary school students. Consequently, the developed media is considered suitable for use in the learning process.

Overall, the validation results from the media, language, and subject-matter experts produced an average score of 95%. Based on these findings, the Spin Smart Board can be categorized as **highly feasible** for use as mathematics learning media. The validation results demonstrate that the media has fulfilled the essential requirements of instructional media in terms of design quality, linguistic appropriateness, and content accuracy. Therefore, the Spin Smart Board is considered suitable for supporting mathematics instruction and facilitating students' conceptual understanding, particularly in learning place value.

2. Improvement of Students' Conceptual Understanding

The analysis of students' conceptual understanding was conducted to determine whether the Spin Smart Board media was effective in improving students' understanding of place-value concepts. Its effectiveness was assessed by comparing students' pretest and posttest results before and after the implementation of learning activities using the Spin Smart Board media.

The pretest results showed that the students obtained a total score of 2,679, with an average score of 63.78. This score represented students' initial level of conceptual understanding before receiving instruction using the developed media. After the implementation of the Spin Smart Board, the students obtained a total posttest score of 3,761 out of an ideal total score of 4,200, with an average score of 89.54. The substantial increase from the pretest average of 63.78 to the posttest average of 89.54 demonstrates an improvement in students' conceptual understanding after participating in learning activities using the Spin Smart Board media.

The findings regarding the improvement between pretest and posttest scores are supported by Mega et al. (2025). Their research involving Grade IIIA students at SDN 15 Cakranegara found that learning activities using Papin multiplication media had a positive effect on students' understanding of whole-number multiplication operations. The experimental class obtained an average posttest score of 78.00, compared with an average pretest score of 37.50 before the use of the learning media. These findings suggest that the use of concrete instructional media can facilitate students' understanding by presenting learning materials in a more tangible, structured, and comprehensible manner. This is consistent with Abdullah (2016), who emphasized that instructional media can support the explanation of learning content by making abstract concepts more concrete and accessible to students.

In the present study at SDN Cibatuh 02, students' posttest performance after using the Spin Smart Board showed a substantial improvement compared with their pretest performance. The posttest average of 89.54 falls within the score range of 85–100 and can therefore be interpreted as a very high learning outcome. This finding indicates that the majority of students were able to understand mathematical concepts, particularly place value, more effectively after participating in learning activities supported by the Spin Smart Board.

However, the effectiveness category should not be assigned directly to the pretest score because the pretest functions only as an indicator of students' initial ability before treatment. Similarly, the effectiveness of the media should not be determined solely from the posttest score. Rather, the effectiveness of the Spin Smart Board is demonstrated by the magnitude of improvement

between students' pretest and posttest performances. For this reason, the normalized gain, or N-Gain, was calculated to provide a more appropriate measure of learning improvement.

The N-Gain analysis produced a score of **0.71**, which falls within the **high improvement category**. This result indicates that the learning intervention using the Spin Smart Board produced a substantial improvement in students' conceptual understanding. The N-Gain result reinforces the descriptive comparison between the pretest and posttest scores and provides stronger evidence that the developed media was effective in supporting students' learning. Thus, the effectiveness of the Spin Smart Board is not merely reflected in students' high posttest scores but, more importantly, in the considerable improvement achieved from their initial level of understanding.

The increase in students' conceptual understanding indicates that the Spin Smart Board provides opportunities for students to engage with mathematical concepts in a more concrete, interactive, and meaningful manner. Through its visual and interactive features, the media assists students in recognizing, distinguishing, and understanding place values more easily. Therefore, the Spin Smart Board can be considered an effective instructional medium for improving students' conceptual understanding of mathematics.

In addition to the pretest and posttest results, data concerning the practicality of the developed media were obtained through questionnaires administered to teachers and students after the Spin Smart Board had been used in field trials. The teacher response questionnaire produced a percentage score of 96%, while the student response questionnaire obtained a percentage score of 93%. The average practicality score was therefore approximately 95%, indicating that the Spin Smart Board falls within the **highly practical** category.

The results of the teacher response questionnaire are supported by Sari and Fatimah (2024), who reported that the Papapin learning media obtained a total teacher response score of 52, corresponding to a percentage of 94%, and was categorized as highly practical. In comparison, the present study obtained a teacher response percentage of 96%. This finding suggests that teachers considered the Spin Smart Board easy to use, appropriate for classroom instruction, and helpful in facilitating the teaching of mathematical concepts. The high teacher response score also indicates that the media can be practically integrated into classroom learning activities without creating substantial difficulties for the teacher.

The results of the student response questionnaire are also consistent with the findings of Sari and Fatimah (2024). Their study reported a student response score of 1,057, equivalent to a practicality percentage of 92%. This result demonstrated that the learning media was considered practical and capable of facilitating the learning process. In the present study, the Spin Smart Board obtained a total student response score of 1,955, corresponding to a percentage of 93%. This high percentage indicates that students responded positively to the use of the media and perceived it as accessible, engaging, and helpful for understanding the learning material.

The positive responses from both teachers and students demonstrate that the Spin Smart Board is not only feasible from the perspective of expert validation but also practical when implemented in an actual classroom setting. The media can be operated effectively by teachers and used comfortably by students during mathematics learning activities. Its practicality is

particularly important because instructional media that are theoretically appropriate but difficult to implement may have limited value in classroom practice.

Based on the overall teacher and student responses, which produced an average practicality score of approximately 95%, the Spin Smart Board can be categorized as **highly practical** and easy to use in mathematics instruction for Grade 2 students at SDN Cibatu 02. When considered together with the expert validation results, the improvement in pretest and posttest scores, and the N-Gain score of 0.71, these findings demonstrate that the Spin Smart Board is **highly feasible, highly practical, and effective** in supporting students' conceptual understanding of place value in elementary mathematics learning.

CONCLUSION

Based on the research and development conducted at SDN Cibatu 02, it can be concluded that the Spin Smart Board learning media was successfully designed based on the learning needs and characteristics of Grade 2 students, who tend to respond positively to learning activities that integrate play and interaction. The media was developed through an interactive game-based approach by integrating learning objectives, place-value concepts, and the cognitive developmental characteristics of elementary school students, resulting in an active, engaging, enjoyable, and less monotonous learning environment. In terms of feasibility, the Spin Smart Board underwent validation by media, subject-matter, and language experts, and the overall validation results indicated that the media was categorized as **highly feasible** for classroom use. The experts confirmed that the media was appropriate in terms of content accuracy, visual appearance, language use, readability, and suitability for Grade 2 students, demonstrating that the developed product met the required feasibility criteria. Furthermore, the Spin Smart Board was effective in improving students' conceptual understanding of place value in mathematics. The students' average score increased from **63.7 on the pretest to 89.5 on the posttest**, indicating a substantial improvement after the implementation of the media. This improvement was further supported by an **N-Gain score of 0.71**, which falls within the **high improvement category**. Therefore, the findings demonstrate that the Spin Smart Board is a highly feasible and effective learning medium for improving Grade 2 students' conceptual understanding of place value in mathematics.

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