



Analysis of The Validity Level of The Pohon Tempel Rakit Media to Improve The Learning Outcomes of Fouth Grade Elementary School Students

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ABSTRACT

This study aims to analyze the validity level of the Pohon Tempel Rakit learning media on the topic of plant parts and their functions to improve the learning outcomes of fourth-grade elementary school students. This study uses a Research and Development (R&D) approach with a 4-D development model, which consists of the stages of Define, Design, Develop, and Disseminate. The research subjects included media experts, material experts, and language experts who acted as validators of the developed product. Data were collected through a validation questionnaire and analyzed using descriptive quantitative techniques. The results showed that the media validity score reached 96% and was categorized as very valid, the material validity score reached 84% and was categorized as very valid, and the language validity score reached 68% and was categorized as valid. These findings indicate that the Pohon Tempel Rakit learning media meets the requirements in terms of design, content, and language. Therefore, the media is considered suitable for use in the learning process and has the potential to increase student engagement, conceptual understanding, and learning outcomes on the topic of plant parts and their functions.

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1. INTRODUCTION

Education is a lifelong, limitless process. Essentially, every individual needs education as a means of self-development. A lack of education has the potential to negatively impact an individual. Through education, a person's personal qualities can be enhanced, from knowledge and attitudes to skills, which continuously develop along with the learning process. Therefore, education has no boundaries and remains relevant at every stage of human life (Kurniawan et al., 2023).

Education, at the macro level, has a profound interconnection with all aspects of human existence. This symbiotic relationship positions every dimension of life as an integral part of a continuous pedagogical process, so that a person's life style is a direct reflection of the educational pattern they receive. As a teleological (goal-oriented) endeavor, education demands objective evaluation instruments or yardsticks to measure the effectiveness of achieving these goals. In the discourse on national education in Indonesia, this urgency is realized through the establishment of competency standards that must be met within a certain timeframe as a parameter for the successful achievement of national education goals (Utami, 2022).

Learning activities in schools are one way to convey knowledge from teachers to students. In implementing these activities, teachers are required to prepare various aspects to ensure optimal learning. Teacher readiness and competence in designing learning activities are crucial, including in lesson planning. Furthermore, learning media is an equally important component in supporting successful learning in schools. Learning media must be designed and developed with student characteristics and development in mind (Sari & Widi, 2025).

Science learning can be enjoyable if teachers are innovative in designing learning activities that meet students' needs. One way to improve the quality of science learning is through the use of concrete media, which allows students to understand the material in a more concrete and meaningful way (Sari & Widi, 2025).

Based on classroom observations and interviews with fourth-grade teachers at SD Negeri 1 Sale, most students experienced difficulties in understanding plant parts and their functions. Learning activities were still dominated by lecture methods and textbook use, resulting in passive student participation during lessons. This condition affected students' conceptual understanding of science topics. These findings are consistent with (Nurlaela et al., 2023), who reported that concrete learning media significantly improve elementary students' understanding of science concepts compared to conventional instruction.

In response to this issue, researchers are interested in conducting an analysis aimed at testing and analyzing the validity of the Pohon Tempel Rakit learning media to improve the learning outcomes of fourth-grade elementary school students. The advantages of this media include creating active, engaging, and easy-to-understand learning. By directly involving students, this media can improve their understanding, motivation, and overall learning outcomes.

The Pohon Tempel Rakit media is an innovative concrete learning medium that combines assembling and attaching plant parts to a tree-shaped learning board. Unlike conventional picture-based media or posters, Pohon Tempel Rakit allows students to interact directly with learning components, making learning activities more engaging, interactive, and meaningful. Through these hands-on activities, students can identify plant parts and understand their functions more concretely.

In conclusion, the Pohon Tempel Rakit is an innovative, concrete learning tool designed to help students understand material through hands-on gluing and assembling activities. This tool combines visual elements and physical activities, enabling students to learn in a more dynamic, engaging, and meaningful way. With this tool, initially theoretical learning concepts can be presented in a more concrete and understandable way.

The Pohon Tempel Rakit media allows students to interact directly with the learning material, such as attaching plant parts and matching their functions to the provided tree media. This can be applied to various learning activities, particularly in elementary school science subjects. Using this media makes the material delivery process more effective by directly involving students in the learning process.

The hope of using the Tree of Tempel Rakit media is that teachers can implement more innovative learning that is tailored to the characteristics of elementary school students. Teachers can utilize the Tree of Tempel Rakit media as an alternative learning activity to help students become more active, motivated, and able to improve their understanding and optimal learning outcomes.

2. RESEARCH METHODOLOGY

This research uses the 4-D R&D development model. The 4-D model is a systematic and effective approach to developing media and learning tools. Through the stages of Define, Design, Develop, and Disseminate, this model ensures that the resulting learning products are aligned with student needs and the learning context. Several empirical studies have shown that the application of the 4-D model contributes to improving the quality of the learning process and student learning outcomes. Therefore, this model is worthy of recommendation for use in the development of media and learning tools at various levels of education ([Rahayu, 2025](#)).

The selection of this model is based on its systematic, simple, and clearly structured procedures, so that it is in accordance with the researcher's objectives, namely to develop and analyze the validity of the Pohon Tempel Rakit media so that it is suitable for use in science learning. The 4D development model (Define, Design, Develop, Disseminate) allows researchers to go through sequential stages starting from needs analysis to product dissemination, so that the resulting media is truly appropriate to student characteristics and learning objectives. The development procedures at each stage of the 4-D model include: Define Stage: Researchers conduct observations, teacher interviews, analyze student characteristics, analyze plant material, and identify learning media needs, Design Stage: Researchers develop the Pohon Tempel Rakit media design, determine the material, create visual designs, select the materials to be used, and develop validation instruments for the media, material, and language, Develop Stage: The created media is validated by media experts, material experts, and language experts. The validation results are used as the basis for revisions until the media is declared suitable for use, Disseminate Stage: The validated media is disseminated to teachers and schools as an alternative medium for science and science learning. Furthermore, the 4D model's development process also involves a validation stage by experts, including material experts, media experts, and language experts. Through the development stage, the Pohon Tempel Rakit media will be revised based on the assessment results, suggestions, and input from the experts before being tested on students. This ensures that the developed media is not only visually appealing but also has the appropriateness of content, language, and presentation, allowing it to be used efficiently in teaching.

This study used a specific instrument to test the validity of the proposed learning media,

a validator assessment questionnaire for the Pohon Tempel Rakit media. This instrument was designed to obtain assessment data from competent experts, including material experts, media experts, and linguists. The assessment covered several important aspects, such as the appropriateness of the content, the media's appearance and design, and the clarity of language used in the media.

Through this questionnaire, validators can objectively assess the suitability of the Pohon Tempel Rakit media and provide constructive suggestions and feedback. The results of these measurements will then be used as a basis for improving and refining the media, ensuring that the developed Pohon Tempel Rakit media is more valid, feasible, and effective for use in teaching.

A questionnaire is a data collection instrument consisting of a series of questions given to respondents who are willing to provide answers according to the researcher's needs. This instrument is constructed using a Likert scale as the basis for assessment. The scale consists of five categories: Very Valid (score 5), Valid (score 4), Fairly Valid (score 3), Less Valid (score 2), and Invalid (score 1). This scoring aims to assess the level of suitability of a medium or instrument based on its quality and the need for any necessary revisions (Amalya Rosyida & Agustin, 2025).

3. RESULT AND DISCUSSION

In this research, the development of learning media was carried out using the 4D model, which includes four main stages: Define, Design, Develop, and Disseminate. Each stage was carried out systematically and structured to ensure that the resulting product meets learning needs and is of optimal quality.

The Define stage focuses on identifying needs and emerging learning challenges, as well as establishing media development objectives. The Design stage involves conceptualizing and developing scenarios for the learning media to be developed. The Develop stage is the process of creating and testing the media based on the established concept, including validation by experts. The Disseminate stage encompasses the dissemination and implementation of the learning media to target users, namely teachers and students, so that the media can be optimally applied in the teaching process.

3.1 Model 4-D

3.1.1 Define

The results of the needs analysis indicate that the learning outcomes of fourth-grade students at SD Negeri 1 Sale in science are still below the Minimum Competency (KKM). In the learning process, teachers tend to use conventional methods, relying on textbooks without the support of interactive learning media, resulting in monotonous and ineffective learning activities. This condition results in a lack of student interest and participation in learning. Therefore, engaging and innovative learning media are needed to increase student motivation and understanding.

Based on the analysis, researchers found that students struggled to understand the material on plant parts and their functions. Students struggled to identify parts such as roots, stems, leaves, flowers, and fruit, and to accurately explain the function of each. This was because the learning process was still abstract and focused solely on textbook explanations without any concrete media to facilitate visualization.

Furthermore, the lack of media that involves hands-on activities makes students less active in learning. Therefore, concrete teaching media such as the Pohon Tempel Rakit are needed, which can support students' direct understanding of the material through sticking and assembling activities, making learning more meaningful, interactive, and understandable.

In science subjects, which require students to achieve learning outcomes related to understanding plant parts and their functions, contextual and concrete learning presentations are essential. This material cannot be delivered solely through textbooks; it requires learning media that can provide real-world visualizations to facilitate student understanding of the concepts. This aligns with research (Nurlaela et al., 2023) which states that the use of concrete media can improve students' understanding and learning outcomes because it provides direct learning experiences.

In science lessons, particularly regarding plant parts, students often struggle to identify parts such as roots, stems, leaves, flowers, and fruit and explain their functions. Therefore, teaching aids that can concretely visualize these concepts are needed, such as the Rafted Tree. The use of concrete media has been shown to increase student engagement and make the learning process more meaningful. Research Rachmawati et al., (2023) also revealed that real media can improve students' cognitive learning outcomes on plant structure material.

The need to achieve the science learning outcomes in plant parts is not limited to just knowing the names of these parts, but also understanding the functions and important roles of plants in life. Through this learning, students are expected to develop a sense of environmental concern, plant care, and understanding their importance to human life. This is supported by research (Setyowati, 2024) which states that the use of concrete media can improve conceptual understanding and foster positive attitudes toward the learning environment.

Based on these problems, researchers formulated a solution by developing a "Raft Stick Tree" learning medium tailored to the characteristics of elementary school students. This medium is designed to provide hands-on learning experiences through the activity of sticking and assembling plant parts, making learning more interactive and meaningful.

Before the Pohon Tempel Rakit media was widely used, a validation phase was conducted by experts including material experts, media experts, and linguists. This phase aimed to ensure that the developed media met the requirements for content, presentation, and language use. Once declared valid, the Pohon Tempel Rakit media was then piloted on students to determine its effectiveness in improving understanding and learning outcomes.

Thus, the use of the Rafted Tree media in science learning is expected to increase student involvement, facilitate understanding of the concept of plant parts, and create more active, concrete, and meaningful learning.

3.1.2 Design

Researchers designed learning media that were easy to understand and could be used effectively through several steps, namely: (a) collecting relevant teaching materials from various sources, such as books and the internet; (b) designing the Pohon Tempel Rakit media; and (c) compiling a validation questionnaire instrument aimed at material experts, media experts, and language experts.

During the learning materials collection stage, researchers read various reading materials from various sources, where the material was adapted to the material that could be included in the media. Researchers also prepared various components of the "Pohon Tempel Rakit" media in the form of printed and attractively designed images of plant parts to be attached and assembled on a tree-shaped media. These components include roots, stems, leaves, flowers, and fruit, which are arranged separately for interactive use by students. The concrete nature of the "Pohon Tempel Rakit" media allows students to interact directly through pasting and assembling activities, so that learning becomes more active and meaningful. This is in line with research (Adhiyah, 2023) which shows that the use of concrete media can help students construct knowledge through direct experience and improve learning outcomes.

The next process is to design and assemble the Pohon Tempel Rakit media as a concrete learning medium for the material of plant parts. This process begins with determining the design of the tree-shaped media that is adapted to the learning material, then the researcher prepares components such as images of roots, stems, leaves, flowers, and fruit that are made separately so that they can be attached and assembled by students. Next, the researcher prints, cuts, and laminates the components to make them more attractive and durable, then attaches adhesives such as velcro to each part so that it can be used interactively.

Afterward, the researchers compiled learning materials to be incorporated into the "Pohon Tempel Rakit" media, such as plant part name cards and corresponding function cards. This media was then designed for direct use by students in learning activities through pasting and assembling, enabling them to grasp the concepts concretely and meaningfully.

The use of concrete media such as the Rafted Tree in learning has been shown to improve student activity and learning outcomes because students are directly involved in the learning process. This aligns with research (Muna et al., 2024) which found that the use of concrete media can significantly increase student activity and learning outcomes.

The validation questionnaire development stage for experts was carried out to facilitate the assessment process by grouping indicators according to the content and media suitability aspects. Researchers developed three types of questionnaires with different assessment indicators, namely for media, material, and language validation. In the media expert validation questionnaire, the assessment focused on appearance aspects, such as media attractiveness, image clarity, color composition, and other visual elements that meet the expert assessment criteria. Furthermore, in the material expert validation questionnaire, the assessment was directed at the suitability of the material, clarity of presentation, and the relationship between images and visual examples with the material presented. Meanwhile, in the language expert validation questionnaire, the assessment focused on the accuracy of sentence use, word choice, spelling, and compliance with applicable language rules.

3.1.3 Develop

The validation process for the developed learning media was conducted through a feasibility test conducted by experts in their respective fields of expertise. This activity aimed to assess the media's suitability based on aspects of material, presentation, language, and technical use. During the validation, researchers communicated directly with experts with relevant skills and experience, such as material experts, learning media experts, and language experts, including through interviews to obtain more in-depth input.

Each expert provided an assessment based on the developed instrument, while also providing constructive suggestions and input to refine the developed media. This assessment process played a crucial role in ensuring that the resulting learning media was not only visually appealing but also had accurate content, was easy for students to understand, and was effective for use in learning activities. Through this validation test, the quality and suitability of the media could be further assured before it was implemented in the pilot phase with students.

The score calculation is carried out by dividing the total score results by the maximum score, then multiplying by 100%, then the percentage score validity will be obtained. The Pohon Tempel Rakit media is said to be valid if the final value of the validation sheet is $\geq 63\%$, and is categorized as very valid if the final value reaches $\geq 82\%$, the following is an explanation of the validation criteria table:

Description	Criteria
$82\% < x \leq 100\%$	Very valid
$63\% < x \leq 81\%$	Valid

44% < x ≤ 62%	Less valid
25% < x ≤ 43%	Invalid

Source: (Irhasyuarna & Yulinda, 2022)

a. Media Expert Validation Results

The scores obtained are the result of a validation process for the design and content aspects of the learning media. This validation activity aims to assess the suitability of the visual appearance, layout, readability, and relevance of the material to the established learning objectives. The assessment is conducted by experts using a systematically developed validation instrument.

Next, all validation data was summarized and presented in a table to facilitate analysis and provide a clear picture of the validity of the developed learning media. A summary of the assessment results is presented in the following table.

Table 2 Media Expert Assessment Results

No	Assessment Indicator	Score
1.	Attractive media display	4
2.	Design appropriate to student	5
3.	Neat and systematic media layout	5
4.	Clear media image/illustration quality	5
5.	Easy-to-read font size and type	4
6.	Media easy to use for teachers and students	5
7.	Clear media usage flow	5
8.	Media supports interaction in learning	5
9.	Media is able to attract students' interest and attention	5
10.	Media is appropriate to learning objectives	5
Total Score		48
Result Percentage		96%
Criteria		Very Valid

Based on validation results conducted by media experts, the Pohon Tempel Rakit learning media product received a score of 96%. This score falls into the "very valid" category, indicating that the media meets validity criteria in terms of design, visual appearance, and other technical elements.

With the validation results showing a positive assessment from media experts, it can be concluded that the Pohon Tempel Rakit media is suitable for further testing with students. This stage aims to determine the media's effectiveness in improving learning outcomes.

The high level of validity of the Pohon Tempel Rakit media indicates that this media has good suitability in terms of appearance, design, and ease of use. The validity percentage of 96% indicates that the media is able to meet the learning needs of elementary school students. This result is in line with research by (Muna et al., 2024) which states that the use of concrete media can improve student learning activities because it provides direct and meaningful learning experiences.

b. Material Expert Validation Results

The scores obtained are the result of a validation process that encompasses several key aspects: suitability to learning objectives, completeness and accuracy of material content, and clarity of presentation. These three aspects are assessed by experts to ensure that the developed learning media is truly relevant, on-target, and easily understood by students.

The assessment process is conducted using a previously developed validation instrument, with each assessment item assigned a score according to its level of achievement. The validation results are then summarized and presented in tabular form to facilitate analysis of the overall level of validity of the learning media. A summary of the assessment results from the validators is presented in the following table.

Table 3 Material Expert Assessment Results

No	Assesment Indicator	Score
1.	The material aligns with the applicable curriculum	4
2.	The material aligns with the learning objectives	4
3.	The concept of the function of plant parts is correct	4
4.	The labels attached to the plant parts on the media are consistent	5
5.	The material is presented in a coherent and easy-to-understand manner	5
6.	The pasting activity helps students understand the function of each part	5
7.	The material encourages students to be active in learning	4
8.	The material is appropriate for the developmental level of elementary school students	4
9.	The material can relate concepts to everyday life	3
10.	The material supports independent and group learning	4
Total score		42
Result Percentage		84%
Criteria		Very Valid

Based on validation results conducted by content experts, the developed learning media received a score of 84%. When converted to validity criteria, this score falls into the "very valid" category, indicating that the media meets the eligibility standards in terms of content, appropriateness, and relevance to learning objectives.

The validity of the material, which is in the very valid category, indicates that the media content is in accordance with the learning outcomes, learning objectives, and characteristics of elementary school students. The material presented in Pohon Tempel Rakit media helps students understand the concept of plant parts more concretely. This finding supports the research of (Nurlaela et al., 2023) which stated that the use of concrete media can improve the understanding of science concepts in elementary school students.

c. Linguist Expert Validation Results

The scores obtained are the result of a validation process for linguistic aspects, which include appropriate language use, clarity of sentence structure, and accuracy of punctuation. All assessment results have been summarized and presented in the following table.

Table 4 Results Of The Linguist's Assessment

No	Assesment Indicator	Score
1.	The language used is easy to understand	3
2.	Sentences in the media are clear and unambiguous	4

3.	Language is appropriate to the students' developmental level	3
4.	Terminology is appropriate to the learning material	3
5.	Grammar is in accordance with Indonesian language rules	4
6.	Spelling and punctuation are used correctly	3
7.	Language is communicative and engaging	4
8.	Language is able to convey character values to students	3
9.	Language is consistent in its presentation	3
10.	Sentence structure is effective and easy to understand	4
Total Score		34
Result Percentage		68%
Criteria		Valid

Based on validation results conducted by language experts, the Pohon Tempel Rakit learning media achieved a score of 68%. Although it was categorized as valid, the language validation results indicated that several linguistic aspects still needed improvement, such as word choice, terminology consistency, and sentence effectiveness. Improvements in language aspects are necessary to ensure the information conveyed in the media is more easily understood by students, according to their language development level. Based on the validity interpretation criteria, this score falls into the "valid" category, indicating that the media is suitable for use in the learning process.

Therefore, it can be concluded that the Pohon Tempel Rakit learning media developed has met the eligibility standards based on expert validation results. Therefore, this media is deemed suitable for use in the learning process, in terms of content, appearance, language, and presentation techniques.

3.1.4 Disseminate

In the context of developing teaching materials, the dissemination stage is implemented through socialization activities by distributing teaching materials on a limited basis to teachers and students (Slamet, 2021). As a follow-up to the development results, efforts were made to disseminate information and utilize learning media to research subjects, namely teachers and school officials at SD Negeri 1 Sale, as well as the general public. This step aims to implement the development results more broadly, thereby supporting the creation of a more innovative learning process and becoming an efficient learning resource in meeting the needs and improving student learning outcomes.

4. CONCLUSION

Based on the results of the study and analysis, it can be concluded that the Pohon Tempel Rakit educational media developed using the 4-D model has met the validity and suitability requirements for use in science learning at the school level. This is supported by the validation results of 96% (very valid) for the media, 84% (very valid) for the material, and 68% (valid) for the language. To increase student engagement in the learning process, Pohon Tempel Rakit Media can provide more realistic, interactive, and interesting learning. Thus, this media can be used as an innovative alternative learning media that can help improve the understanding and learning outcomes of fourth-grade students in elementary schools.

5. REFERENCE

- Adhiyah, M. (2023). Pembelajaran Konstruktivisme Berbantuan Media Benda Konkret untuk Meningkatkan Hasil Belajar Siswa ada Materi Bangun Ruang di Sekolah Dasar. *BASICEDU*, 7(4), 2075–2081.
- Amalya Rosyida, J., & Agustin, I. (2025). Analisis Tingkat Validitas Media Prezi Berbasis Augmented Reality Terhadap Hasil Belajar Pendidikan Pancasila Siswa Kelas VI SD. *JPK*, 10(2), 163–172.
- Irhasyuarna, Y., & Yulinda, R. (2022). Pengembangan Media Pembelajaran Interaktif menggunakan Ispring suite 10 pada Materi Reproduksi Tumbuhan untuk Mengukur Hasil Belajar. *JUPEIS*, 1(3).
- Kurniawan, A., Nurislamiah, S., Rachmijati, C., Artiani, L. E., Muliani, N. M., & Azhari, A. (2023). *Landasan Pendidikan*. PT Arr Rad Pratama.
- Muna, B., Saputro, B. A., & Rahayu, L. P. (2024). PENERAPAN PROBLEM BASED LEARNING BERBANTUAN MEDIA KONKRET UNTUK MENINGKATKAN AKIVITAS DAN HASIL BELAJAR SISWA KELAS IV SD SUPRIYADI 02. *SNPPG*, November 2023, 3118–3125.
- Nurlaela, E., Magdalena, I., & Unaenah, E. (2023). PENGARUH MEDIA KONKRET TERHADAP HASIL BELAJAR IPA PADA SISWA KELAS IV SDN BENCONGAN 6 KABUPATEN TANGERANG. *FONDITA Jurnal Pendidikan Dasar*, 7(September 2023), 589–598.
- Puji Utami, P. (2022). *STRATEGI PEMBELAJARAN PKN* (Issue September). Sekolah Tinggi Keguruan Dan Ilmu Pendidikan Kusuma Negara Jakarta.
- Rachmawati, D. S., Setiyawati, E., & Sartika, S. B. (2023). PENGARUH MEDIA NYATA TERHADAP HASIL BELAJAR THE EFFECT OF REAL MEDIA ON COGNITIVE NATURAL SCIENCE LEARNING OUTCOMES ABOUT ROOTS AND STEMS MATERIAL AT 4th GRADE OF SEKOLAH DASAR. *JKP*, 2(April).
- Rahayu, A. (2025). Metode Penelitian dan Pengembangan (R&D) : Pengertian, Jenis, dan Tahapan. *Jurnl Pendidikan Dan Pengajaran*, 4(3), 459–470. <https://doi.org/10.54259/diajar.v4i3.5092>
- Sari, W., & Widi, M. (2025). Pengaruh Penggunaan Media Konkret Terhadap Hasil Belajar dan Pemahaman Siswa Kelas IV. *Ilmiah Pendidikan Dasar*, 10(September).
- Setyowati, L. (2024). Pengaruh Media Konkret dalam Meningkatkan Hasil Belajar Matematika pada Siswa Kelas IV MIN 1 Gunungkidul. *IJAR*, 2(2).
- Slamet, F. A. (2022). *MODEL PENELITIAN PENGEMBANGAN (R n D)*. Institut Agama Islam Sunan Kalijogo Malang.