

Research Article

Development of A Flashcard Learning Resource for the Make A Match Cooperative Learning Model in The Ipas Subject, Focusing On The Topic of 'Parts of The Body' for Year 1 Students at Sdn Liprak Kidul 1.

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Abstract. This study aims to develop Flashcard learning media based on the cooperative learning model *Make a Match* on the topic *My Body Parts* to improve creative thinking skills and learning outcomes of first-grade students at SDN Liprak Kidul I. The study was motivated by students' low interest and learning outcomes, the dominance of lecture-based teaching methods, limited use of engaging learning media, and low creative thinking skills in IPAS learning. This research employed a *Research and Development* (R&D) method using the ADDIE model, consisting of *Analysis, Design, Development, Implementation, and Evaluation*. The subjects were 25 first-grade students. Research instruments included media and material expert validation sheets, student response questionnaires, and pretest and posttest learning achievement tests. The results showed that the developed Flashcard media had very high validity, practicality, and effectiveness. The media feasibility reached 94.64% based on media expert validation and 90% based on material expert validation. Student responses showed a practicality score of 94.90%, categorized as very practical. The effectiveness was demonstrated by an increase in the average learning score from 64.00 on the pretest to 91.60 on the posttest. The average N-Gain score was 0.7313, categorized as high. Therefore, Flashcard learning media based on the *Make a Match* model is valid, practical, and effective for improving student engagement, creative thinking skills, and learning outcomes in IPAS learning.

Keywords: Creative Thinking Skills; Flashcards; Ipas; Learning Outcomes; Make A Match; Research and Development.

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1. Introduction

Education plays a fundamental role in developing students' knowledge, skills, values, attitudes, and character as the foundation for producing qualified human resources (Nasution et al. in Suyasa, 2022). Elementary education is a crucial stage for fostering students' cognitive, affective, and psychomotor development, enabling them to acquire essential life skills (Fitriyanti et al. in Alimuddin, 2020). In this context, Natural and Social Sciences (IPAS) learning contributes significantly to developing students' understanding of themselves and their environment while simultaneously integrating character education through appropriate instructional approaches (Sholeha & Akhsan in Ayurachmawati, 2024).

Teachers play a central role in creating effective and engaging learning environments, particularly for lower-grade elementary students who require greater guidance and stimulation during classroom activities (Hidayatulloh et al. in Anitah et al., 2023). One of the essential competencies that should be developed at this level is creative thinking, as it enables students to solve problems, generate new ideas, and connect prior knowledge with new learning experiences (Astria & Kusuma in Utami et al., 2023). To facilitate this process, learning media are needed to present instructional materials in an attractive and meaningful way, thereby improving students' understanding and participation in learning activities (Setyaningsih & Atmaja, 2021).

Among various instructional media, Flashcards provide visual learning experiences through pictures, words, symbols, and simple information that help students recognize, understand, and retain concepts more effectively (Akbar et al. in Akbar, 2024). Their effectiveness can be enhanced by integrating them with the Make a Match learning model, which encourages students to actively search for matching question-and-answer cards in an enjoyable learning atmosphere while simultaneously improving collaboration and creative thinking (Lestari in Rusman, 2022).

Preliminary observations conducted in Grade I at SDN Liprak Kidul 1 revealed that classroom instruction remained dominated by conventional lecture methods and textbook-centered learning, resulting in low student engagement and limited opportunities to develop creative thinking skills. This condition reflects a discrepancy between current classroom practices and the student-centered learning expected in elementary education. Previous studies have also reported that teacher-centered instruction with limited learning media contributes to students' low creative thinking abilities (Murdani et al., 2023), while the use of attractive instructional media is considered essential for fostering creativity (Sari & Montessori, 2021).

Considering these challenges, the development of Flashcard learning media integrated with the Make a Match model is expected to provide meaningful, interactive, and enjoyable learning experiences. The visual and game-based characteristics of the media enable students to understand the topic of "My Body Parts" more concretely while encouraging active participation and creative thinking. Therefore, this research aims to develop a Flashcard-based Make a Match learning medium for Grade I IPAS learning at SDN Liprak Kidul 1 and to evaluate its validity, practicality, and effectiveness in improving students' creative thinking skills.

2. Literature review

Learning Media

Learning media are defined as tools, materials, or instructional intermediaries that facilitate teachers in delivering learning content effectively and achieving instructional objectives (Fadilah et al., 2023). Their use is particularly important in elementary education because they help transform abstract concepts into concrete learning experiences while promoting active student participation (Syahrial, 2022). Since first-grade students are still in the concrete operational stage, learning media should provide visual and auditory stimulation to increase motivation, concentration, and comprehension (Hasanah et al., 2021). Learning media can be presented in various forms, including printed, visual, audio, audiovisual, and digital technology-based media, with their selection adjusted to learning objectives, student characteristics, and instructional content (Arsyad, 2023; Ardiyanti & Tyas, 2025). Therefore,

appropriate learning media are expected to create meaningful and engaging learning experiences while improving students' understanding and creative thinking skills.

Flashcards

Flashcards are visual learning media consisting of small cards containing pictures, text, symbols, or their combination to facilitate students in recognizing, remembering, and understanding concepts (Athoillah et al., 2025). These media are particularly suitable for elementary school students because visual representations are more easily understood than abstract verbal explanations during the concrete operational stage (Syahril, 2022; Amalia, 2025). In addition, Flashcards encourage active participation through games, question-and-answer activities, matching exercises, and collaborative learning, thereby increasing students' motivation and supporting the development of creative thinking skills (Sulfianti et al., 2025; Falentina et al., 2025).

IPAS Learning

Natural and Social Sciences (IPAS) integrates natural and social sciences to help students understand environmental phenomena holistically while developing critical thinking and problem-solving skills (Maulidiana et al., 2024). Within the Merdeka Curriculum, IPAS promotes scientific thinking, environmental awareness, and curiosity through contextual learning experiences (Kessy et al., 2025). At the lower elementary level, IPAS emphasizes concrete experiences aligned with children's cognitive development (Nur'aini & Indrapangastuti, 2025). One of the essential learning topics is "My Body Parts," which introduces students to body structures and functions as the foundation for understanding themselves (Safion et al., 2025). Furthermore, IPAS learning provides opportunities to develop creative thinking through observation, educational games, grouping, and matching activities (Khaira et al., 2025).

Make a Match Learning Model

The Make a Match model is a cooperative learning strategy that requires students to match question and answer cards through interactive learning activities (Sari, 2020). This approach actively engages students in identifying appropriate card pairs while promoting communication, collaboration, and meaningful learning (Ermita, 2021). The enjoyable game-based learning atmosphere enhances students' enthusiasm, reduces boredom, and strengthens concept retention (Astutiningsih, 2023). Therefore, integrating Flashcards with the Make a Match model is considered highly appropriate for Grade I IPAS learning, particularly for the topic "My Body Parts," because it encourages active participation and supports students' creative thinking development.

Students' Creative Thinking Skills

Creative thinking refers to the ability to generate original, flexible, and useful ideas for solving problems and is considered an essential higher-order thinking skill in elementary education (Irman et al., 2025). Its main indicators include fluency, flexibility, originality, and elaboration (Melihayatri et al., 2025). Developing these competencies requires engaging, interactive, and student-centered instructional strategies that encourage students to explore ideas, express opinions, and solve problems creatively (Pratama et al., 2025). In IPAS learning, creative thinking enables students not only to memorize concepts but also to relate them to everyday experiences (Herung et al., 2025). Consequently, Flashcard-based Make a Match activities are expected to facilitate students in connecting concepts, generating ideas, and strengthening creative thinking skills.

VOSviewer Analysis

The VOSviewer bibliometric visualization identifies student as the central keyword connected to Flashcards, motivation, and vocabulary, indicating that students are the primary focus of learning innovation. The direct relationship between Flashcards and students demonstrates the important role of visual media in improving engagement and conceptual understanding, while the association between motivation and vocabulary suggests that learning motivation contributes to students' conceptual mastery. These findings support the development of Flashcard-based Make a Match media as an instructional innovation designed to improve students' engagement, conceptual understanding, and creative thinking skills in IPAS learning.

Previous Studies

Previous studies consistently demonstrate the effectiveness of innovative learning models and Flashcard media in improving students' learning outcomes. Guided Inquiry has been shown to enhance creative thinking skills (Herung et al., 2025), while the Make a Match cooperative model increases students' engagement and academic achievement in elementary science learning (Saktiningsih & Noviani, 2026). Flashcards have also been reported to improve mathematics learning outcomes (Athoillah et al., 2025), and Problem-Based Learning combined with Flashcards effectively develops creative thinking skills (Adhani et al., 2026). Similarly, the integration of Flashcards with the Make a Match model significantly improves IPAS learning outcomes in elementary schools (Rahmawati et al., 2024). These findings indicate that Flashcard-based cooperative learning has strong potential to improve both cognitive achievement and creative thinking.

Conceptual Framework

This study is based on the problem of low creative thinking skills among Grade I students, limited use of innovative learning media, and insufficient student participation during classroom instruction. To address these issues, Flashcard-based Make a Match learning media are developed to provide interactive, enjoyable, and student-centered learning experiences. Through matching activities, students are encouraged to think creatively, collaborate with peers, and construct a deeper understanding of IPAS concepts. Therefore, the proposed learning media are expected to improve students' creative thinking skills while enhancing the overall quality of IPAS learning.

3. Research Methods

Research Design

This study employed a Research and Development (R&D) approach to develop an instructional product in the form of Flashcard-based Make a Match learning media for Grade I IPAS learning (Sugiyono, 2023). The study adopted the ADDIE development model, consisting of five sequential stages: Analysis, Design, Development, Implementation, and Evaluation, because of its systematic and practical framework for producing valid, practical, and effective instructional media (Sugiyono, 2023).

Development Procedures

The development process followed the ADDIE model. During the analysis stage, students' characteristics, learning needs, classroom problems, and the IPAS topic "My Body Parts" were identified. The design stage involved preparing learning objectives, designing Flashcards, arranging question-and-answer card pairs, and developing Make a Match learning procedures. In the development stage, the Flashcard media were produced and validated by

media and subject-matter experts before being revised according to their suggestions. The implementation stage consisted of classroom trials involving Grade I students to examine the practicality and effectiveness of the media in improving creative thinking skills. Finally, the evaluation stage was conducted throughout the development process to continuously refine the product based on validation results and field-testing outcomes.

Participants and Product Trial

The research subjects were Grade I students of SDN Liprak Kidul 1, who represented the target users of the developed learning media. In addition, media experts and subject-matter experts participated as validators to evaluate the instructional quality, content accuracy, design, and usability of the Flashcard-based Make a Match media before classroom implementation.

The product evaluation consisted of expert validation followed by field testing. Expert validation assessed the feasibility of the media, while classroom implementation examined its practicality and effectiveness in improving students' creative thinking skills.

Data Collection Instruments

This study employed both qualitative and quantitative data. Qualitative data consisted of suggestions and comments from expert validators as well as classroom observations used for product revision. Quantitative data were obtained from expert validation sheets, student response questionnaires, and pretest-posttest scores measuring students' creative thinking skills.

The research instruments included: Expert Validation Sheets, consisting of material validation and media validation instruments that evaluated content suitability, language, presentation, design quality, usability, and compatibility with the Make a Match learning model. Student Response Questionnaire, which measured students' perceptions regarding attractiveness, ease of use, usefulness, and overall practicality of the developed learning media. Pretest and Posttest, designed based on indicators of creative thinking skills and the IPAS topic "My Body Parts", to measure students' learning improvement before and after using the Flashcard media.

Data Analysis

The collected data were analyzed using both descriptive and quantitative techniques. Validity analysis and student response analysis were conducted using a four-point Likert scale (Risal et al., 2022). The obtained scores were converted into percentages and categorized into feasibility and practicality levels, ranging from Very Poor to Very Good, with scores of 81–100% indicating Very Feasible and Very Practical, respectively. Effectiveness analysis was conducted using the Normalized Gain (N-Gain) formula to determine the improvement in students' creative thinking skills after the implementation of the developed media. The N-Gain scores were classified into high ($g \geq 0.7$), moderate ($0.3 \leq g < 0.7$), and low ($g < 0.3$) categories, enabling the evaluation of the instructional effectiveness of the Flashcard-based Make a Match learning media.

4. Results and Discussion

Results

Product Validation

The developed Flashcard learning media based on the Make a Match cooperative learning model was evaluated by media and subject matter experts to determine its feasibility

before classroom implementation. The validation assessed the aspects of media design, content suitability, language, and usability.

Table 1. Product Validation Results.

Validator	Percentage	Category
Media Expert	94.64%	Very Valid
Material Expert	90.00%	Very Valid

The validation results indicate that the developed learning media achieved a very valid category, with percentages of 94.64% from the media expert and 90.00% from the material expert. These findings suggest that the Flashcard media fulfilled the required standards regarding visual appearance, instructional design, content accuracy, and learning objectives, making it suitable for classroom implementation after minor revisions suggested by the validators.

Students' Response Questionnaire

Following the implementation of the learning media, students completed a response questionnaire to evaluate its practicality.

Table 2. Descriptive Statistics of Students' Responses.

Variable	N	Minimum	Maximum	Mean	SD
Students' Response	25	85.00	100.00	94.90	4.81

The average practicality score reached 94.90%, indicating that the Flashcard media was categorized as very practical. Students considered the learning media easy to use, visually attractive, and helpful for understanding the learning materials. The relatively small standard deviation also indicates that students provided consistently positive responses.

Pretest and Posttest Results

Students' learning achievement was measured using pretests and posttests administered before and after the implementation of the Flashcard media.

Table 3. Descriptive Statistics of Learning Outcomes.

Test	N	Minimum	Maximum	Mean	SD
Pretest	25	40.00	90.00	64.00	12.25
Posttest	25	70.00	100.00	91.60	8.50

The findings demonstrate a considerable improvement in students' learning achievement after using the Flashcard media. The mean score increased from 64.00 in the pretest to 91.60 in the posttest, indicating that students developed a better understanding of the topic "Parts of My Body" after participating in cooperative learning activities using the Make a Match model.

N-Gain Analysis

The effectiveness of the developed media was evaluated using the normalized gain (N-Gain) score.

Table 4. N-Gain Analysis.

Variable	N	Minimum	Maximum	Mean	SD	Category
N-Gain	25	0.00	1.00	0.7313	0.2933	High

The average N-Gain score of 0.7313 falls within the high effectiveness category, indicating that the Flashcard learning media substantially improved students' learning outcomes after the instructional intervention.

Product Revision

The learning media was revised according to recommendations provided by the validators before classroom implementation.

Table 5. Product Revision.

Validator	Suggestions	Revision
Material Expert	Improve indicators to assess creative thinking skills rather than memorization	Learning indicators were revised to measure students' creative thinking skills.
Media Expert	Add supporting learning materials in the user guide	Additional instructional materials were included in the Flashcard manual.

The revisions enhanced both the instructional content and usability of the Flashcard media, ensuring better alignment with the learning objectives and students' characteristics.

Discussion

The findings demonstrate that the Flashcard learning media based on the Make a Match cooperative learning model possesses high levels of validity, practicality, and effectiveness. The expert validation scores (94.64% for media and 90.00% for content) indicate that the developed product satisfies instructional, visual, and pedagogical standards. These results support the Research and Development approach proposed by Sugiyono (2023), which emphasizes iterative validation and revision to produce quality educational products.

The students' response questionnaire also revealed a very high practicality score (94.90%), suggesting that learners perceived the Flashcard media as attractive, easy to use, and supportive of classroom learning. The game-based activities embedded in the Make a Match model encouraged active participation, collaboration, and enjoyable learning experiences. Interactive learning environments such as these are widely recognized for increasing students' motivation and classroom engagement.

Furthermore, students' learning achievement improved considerably after using the developed media. The average score increased from 64.00 in the pretest to 91.60 in the posttest, indicating that the Flashcard media effectively supported students in understanding the learning materials. The visual characteristics of Flashcards, combined with cooperative learning activities, helped students identify concepts more easily and promoted meaningful learning.

The effectiveness analysis further strengthens these findings. The average N-Gain score of 0.7313, categorized as high, demonstrates that the developed media contributed substantially to improving students' learning outcomes. This improvement suggests that integrating visual learning media with the cooperative Make a Match strategy creates an engaging learning environment that supports knowledge retention while simultaneously encouraging students to participate actively during classroom activities.

Overall, the results indicate that the developed Flashcard learning media is suitable for implementation in Grade I science (IPAS) learning. Besides improving academic achievement, the media also creates a more interactive, enjoyable, and student-centered learning process, making it a promising instructional resource for elementary school classrooms.

5. Conclusions and Recommendation

Based on the results of the product development, validation, implementation, and data analysis, the following conclusions can be drawn: The Flashcard learning media based on the Make a Match cooperative learning model was successfully developed using the ADDIE development model and is appropriate for Grade I IPAS learning on the topic *Parts of My Body*. The developed learning media demonstrated a very high level of validity, as indicated by the media expert validation score of 94.64% and the material expert validation score of 90.00%, confirming that the product is suitable for classroom implementation. The Flashcard media also showed excellent practicality, with an average student response score of 94.90%, indicating that students found the media attractive, easy to use, and supportive of active participation during the learning process. The effectiveness analysis produced an average N-Gain score of 0.7313, which falls into the high category, demonstrating that the use of Flashcard media effectively improved students' learning outcomes and supported the development of meaningful and enjoyable learning experiences.

Practical Implications, Teachers are encouraged to use the Flashcard learning media as an alternative instructional resource in Grade I IPAS learning, particularly for the topic *Parts of My Body*. Integrating the media with the Make a Match cooperative learning model can enhance student engagement, participation, and learning achievement while creating a more interactive and enjoyable classroom environment.

Dissemination, The developed Flashcard media may be implemented in other elementary schools with similar student characteristics. The product can also be disseminated through teacher professional development activities, teacher working groups (KKG), and educational media sharing programs to support innovative classroom practices.

Future Research, Future studies are recommended to develop Flashcard learning media for other IPAS topics or different elementary grade levels and to integrate more innovative digital or interactive features. Researchers are also encouraged to conduct large-scale implementation studies involving more participants and different school settings to further examine the effectiveness and generalizability of the developed learning media.

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