



Card Match Circle Learning Media to Improve Science and Social Learning Outcomes

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ABSTRAK

Guru belum memasukkan media pembelajaran ke dalam pembelajaran IPAS, sehingga siswa kesulitan dalam belajar. Berdasarkan hal tersebut tujuan penelitian ini yaitu mengembangkan Media Pembelajaran Card Match Circle. Jenis penelitian ini yaitu Research and Development (R&D) menggunakan ADDIE. Penelitian ini menggunakan kelompok kecil yang terdiri dari 6 subjek siswa kelas V SD. Subjek penelitian yaitu 1 ahli media pembelajaran dan 1 ahli materi pembelajaran. Peserta tes kelompok besar penelitian ini berjumlah 25 orang siswa kelas V. Metode yang digunakan untuk mengumpulkan data yaitu wawancara, observasi, dokumentasi, dan tes. Instrumen pengumpulan data berupa lembar kuesioner dan soal tes. Teknik yang digunakan untuk menganalisis data yaitu analisis deskriptif kualitatif, kuantitatif, dan statistik inferensial. Hasil penelitian yaitu hasil uji kelayakan diperoleh 93,3% dari ahli media, dan 92% dari ahli materi yang masuk dalam kriteria siap dilaksanakan. Hasil uji-t menunjukkan bahwa adanya perbedaan perolehan belajar yang cukup besar antara nilai pretest dan posttest siswa pada kelompok kecil dan kelompok besar. Hasil uji N-gain menunjukkan peningkatan hasil belajar siswa berada pada kriteria sedang. Disimpulkan media pembelajaran card match lingkaran pada materi keanekaragaman flora dan fauna indonesia di kelas V dinyatakan layak digunakan dan efektif untuk meningkatkan hasil belajar peserta didik IPAS di kelas V SD. Implikasi penelitian yaitu media yang dikembangkan membantu memudahkan siswa belajar.

ABSTRACT

Teachers have not included learning media in science learning, so students have difficulty learning. Based on this, this research aims to develop Card Match Circle Learning Media. This type of research is Research and Development (R&D) using ADDIE. This research used a small group of 6 subjects from fifth-grade elementary school students. The research subjects were 1 learning media expert and 1 learning materials expert. The large group test participants for this research were 25 class V students. The methods used to collect data were interviews, observation, documentation and tests. The data collection instruments are in the form of questionnaires and test questions. The techniques used to analyze data are qualitative descriptive analysis, quantitative and inferential statistics. The research results, namely the feasibility test results, were obtained by 93.3% of media experts, and 92% of material experts who met the criteria were ready to be implemented. The t-test results show a fairly large difference in learning gains between the pretest and posttest scores of students in the small and large groups. The results of the N-gain test show that the increase in student learning outcomes is at medium criteria. It was concluded that the circle card match learning media on the diversity of Indonesian flora and fauna in class V was declared suitable for use and effective in improving the learning outcomes of science and science students in class V of elementary school. The research implication is that the media developed helps make it easier for students to learn.

1. INTRODUCTION

Two things cannot be separated and have a very close relationship in educational activities, namely learning and learning activities. Teaching and learning activities are educational activities in which there is involvement between educators and students. Teaching and learning are carried out to direct us to achieve specific goals before carrying out educational activities (Nugroho & Arrosyad, 2020; Weng et al., 2019). Learning is an activity carried out deliberately so that changes occur in a person regarding

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abilities, knowledge, and skills (Montelibano et al., 2023; ubabuddin, 2019; Zain & Jumadi, 2018). One practical place to learn is at school. When studying at school, students will experience various interactions and gain experience so that their abilities change through a learning process. Learning is an activity prepared to help students learn well (Guo et al., 2020; Jaya et al., 2020; Yunita & Maisarah, 2020). Learning is a process of communication interaction both directly, face to face, and indirectly between learning sources, teachers, and students using learning media and the learning models used (Arianto et al., 2020; Sukenti et al., 2020). Learning resources are various resources used in learning to assist educational activities. Learning sources can be data, media, methods, people, or places used in learning (Philippe et al., 2020; Samsinar, 2019). Learning media can facilitate the delivery of information in learning and increase student interest and motivation in learning (Chaidam & Poonputta, 2022; Darwis et al., 2020).

However, the current problem is that teachers' ability to develop innovative learning media is still lacking. This is supported by previous findings, which reveal that the current application of learning media is still not optimal (Mustikah et al., 2023; Sentarik & Kusmaryatni, 2020). Other research findings also confirm that there are several factors behind this. The causal factor is the lack of creativity of educators in creating learning media (Ayurachmawati et al., 2022; Suwastini et al., 2021). The next factor is that there are many other responsibilities, and teachers still find it difficult (Anjarani et al., 2020; Ayurachmawati et al., 2022; Tiyas et al., 2020). The results of observations and interviews at SD Negeri Podosoko 2, Magelang Regency, revealed problems regarding learning in class V students at SD Negeri Podosoko 2. From the observations and interviews, it was seen that several problems occurred in class V Natural Sciences and Social Sciences (IPAS) learning, including other students who achieved scores below the KKM (Minimum Completeness Criteria). Not all students focus and pay attention to the teacher's explanation when learning is in progress. Some students chat with their friends, daydream, and are busy with their activities. Only a few students actively answered and responded to questions given by the teacher. Lack of motivation to learn in class V of SD Negeri Podosoko 2, Magelang Regency, results in low student interest. This impacts reducing students' enthusiasm for reading, especially in science subjects. In fact, reading is the principal capital for understanding the existing material in these subjects. Students also have difficulty understanding and remembering new terms in science subjects, and their critical thinking skills are still limited. In addition, educators have not been able to apply diverse and creative learning models and learning media to attract students' attention and create a fun and student-centered learning environment.

Based on these problems, one solution is to develop learning media to improve student learning outcomes. In encouraging increased student learning outcomes, educators must develop their responsibilities in educating well, for example, by choosing appropriate learning media (Fedorov & Mikhaleva, 2020; Nurrita, 2018; Wungguli & Yahya, 2020). Therefore, teachers must carefully plan, including choosing suitable learning media to achieve educational goals immediately (Febliza & Okatariyani, 2020; Nadori & Hoyi, 2020; Wulandari et al., 2023). Using learning media significantly increases the effectiveness of education, and the material presented will be more accessible for students to understand (Handayani & Abadi, 2020; Nababan, 2020). Learning media can trigger new enthusiasm and interest, increasing students' learning motivation (Chusna & Wahyuningtyas, 2020; Ferdiansyah et al., 2020). Using learning media can make learning more active and developed (Akhliis, 2023; Nurmalasari et al., 2022). With learning media, the material presented will be easier to apply, make analogies, and solve problems more clearly and effectively (Anggita, 2020; A. S. Nugroho & Wahyuni, 2021). Through the application of learning media, learning in class will also feel more fun, exciting, and not dull; students can also be more directly involved during educational activities. One learning media that can be used is Card Match Circle Learning Media. Card Match Circle media is the form of cards (Prabowo et al., 2020; Sexcio & Dafit, 2022; Yatini, 2021). This media design is based on visual principles (Asti & Roswita, 2022; Devi et al., 2020). The Card Match Circle learning tool is in picture cards modified into a game (Chusna & Wahyuningtyas, 2020; Ristanti & Arianto, 2019). The advantage of using picture card media in educational activities is that it can explain material without much verbal language but is more impressive (Pratomo et al., 2020; Ristanti & Arianto, 2019). Previous research findings state that teaching materials, learning environment, learning media and resources, and educators as learning subjects are four essential components that influence student learning success (Mertasari & Ganing, 2021; Sari et al., 2023; Udayani et al., 2021). The application of learning media can facilitate content presentation, thereby increasing students' understanding and learning motivation (Biassari et al., 2021; Larasati & Nugroho, 2023). However, there has been no study regarding Card Match Circle Learning Media to Improve Science and Science Learning Outcomes for Class V Elementary School Students. This research aims to develop Card Match Circle Learning Media to improve Science and Science Learning Outcomes for Class V Elementary School Students. The material used in this research is class V science material about the diversity of Indonesian flora and fauna. The advantage of this media is that it relies on students' individual

characteristics. The media used is appropriate to improve student learning outcomes. It is hoped that Card Match Circle Learning Media can make it easier for students to learn so that it can improve student learning outcomes significantly.

2. METHOD

This research uses the Research and Development (R&D) method, which aims to develop a product. This research produces card match circle learning media products in spins, picture cards, and challenge cards for class V students on the distribution of flora and fauna in Indonesia. The procedure for developing this research is ADDIE, which consists of five stages: Analysis, Design, Development, Implementation, and Evaluation (Sugiyono, 2019). At the analysis stage, an analysis will be carried out through interviews and observations to determine the product or media that will be developed and used. At the design stage, researchers design the product or learning media that will be developed and prepare learning tools, including material that will be presented using the media developed. At the development stage, the learning media is created. At the implementation stage, product validation or feasibility testing should be carried out with media experts and material experts, and trials on using media in learning in small group experiments and extensive group experiments in class V at SD Negeri Podosoko 2 should be conducted. At the evaluation stage, carry out evaluations through pretest and posttest questions. to students. The research location is in class V of SD Negeri Podosoko 2, Magelang Regency. This research used a small group consisting of 6 subjects of class V students at SD Negeri Podosako 2 with heterogeneous types. The research subjects were 1 learning media expert and 1 learning materials expert. This research's large group test participants were 25 fifth-grade students at SD Negeri Podosako 2. The methods used to collect data were interviews, observation, documentation, and tests. The observations used in this research use structured observation because the researcher knows precisely the variables to be observed. Observations were carried out initially to obtain initial data by identifying problems in class V of SD Negeri Podosoko 2, Magelang Regency. Data collection through interviews to collect facts that occur in elementary schools. Interviews were conducted by researchers together with class V teachers at SD Negeri Podosoko 2. In this research, documents in the form of photos, videos, and other supporting documents were used. In this research, fifth-grade students at SD Negeri Podosoko 2, Magelang Regency, were given tests to test their' abilities. The data collection instruments are questionnaires and test questions. The instrument grid is presented in Table 1.

Table 1. Research Instrument Grid

No	Instrument	Indicator
1	Presentation	<ol style="list-style-type: none"> 1. Suitability of the material in the Card Game Circle Learning Media 2. The images presented are in accordance with the flora and fauna material in Indonesia 3. The images presented are easy to understand
2	Theme Selection	<ol style="list-style-type: none"> 1. Meaningfulness of the theme for students 2. Suitability of the theme to student development
3	Material Contents	<ol style="list-style-type: none"> 1. Meaningfulness of the theme for students 2. Suitability of the theme to student development 3. Picture card material has a clear purpose 4. Material can increase knowledge

The techniques used to analyze data are qualitative descriptive analysis, quantitative and inferential statistics. Qualitative descriptive analysis is used to manage data in the form of input provided by experts regarding card match circle learning media. Quantitative descriptive analysis is used to manage data in the form of scores given by experts regarding card match circle learning media. Inferential statistical analysis is used to test the effectiveness of card match circle learning media in improving student learning outcomes.

3. RESULT AND DISCUSSION

Result

This research aims to develop Card Match Circle learning media using the ADDIE model. The results of each stage are as follows. First, analyze. At this stage, we conducted observations and interviews at SD Negeri Podosoko 2, Magelang Regency regarding the learning process there. At this stage the researcher knew that the fifth grade teacher had not used learning media in the science and science subject. The teacher only explains orally or writes on the blackboard. Therefore, this research chose to develop Card Match Circle learning media which is adapted to the development of elementary school age children who like to play. At this stage, we also choose science material in class V, namely the diversity of Indonesian flora and fauna. Second, design. At this stage, the researcher designs the media developed by creating the necessary designs, namely spins, cards, card boxes and answer boards using the Canva application. At this stage, we also create a learning design by creating learning tools according to the material used. The learning model used is TGT (Teams Games Tournamnet). TGT (Teams Games Tournamnet) learning is a collaborative learning model that encourages increased student involvement because they are required to compete in groups to get points obtained by answering questions correctly.

Third development: at this stage, the Card Match Circle media was developed based on the results of the previously developed design. The card game circle learning media consists of rounds, question cards, answer cards, challenge cards, and answer boards. The spins are made of wood with a diameter of 25 cm and a spin height of 40 cm, totaling 2 pieces. The cards are printed with 6.5 cm x 9 cm dimensions using ivory paper. The answer board is a 100 cm x 50 cm banner containing a map of the distribution of Indonesian flora and fauna, equipped with 2 pockets in each part (west, center, east). 2 groups play this media circle card game. This game consists of 3 parts: turning the round, choosing a question card and answer card or, choosing a challenge card and answering it, and putting the card into the pocket on the answer board. Each section is the responsibility of 1 student in each group. 1 round of the game is only given 30 seconds. Every time the round changes, all students must also take turns in each part of the game. Development results are presented in [Figure 1](#).



Figure 1. Card Match Circle Media Developed

Fourth, implementation. At this stage, a feasibility test of the circle card match learning device was carried out with media experts and material experts. In addition, it also tests the card matching circle. The trials consisted of small trials with 6 participants and large trials with 25 students. The feasibility percentage results from media experts were 93.3% and from material experts were 92%. Therefore both are included in the very feasible criteria. Fifth, evaluation. At the evaluation stage, data analysis of pretest and posttest scores carried out by students in small group experiments and large group experiments was carried out. From the results of the normality test using SPSS version 26.0 software, the pretest sig value = 0.452 > 0.05, which means H_0 is accepted. Meanwhile, for the posttest, sig = 0.961 > 0.05, which means H_0 is accepted. This shows that the test data comes from a normally distributed population. Based on these data calculations, the pretest and posttest data from the small group test were normal. The results of the small group normality test are presented in [Table 2](#). The results of the large group normality test are presented in [Table 3](#). The normality test carried out with SPSS version 26.0 on a large group produced a pretest sig value = 0.174 > 0.05, indicating acceptance of H_0 . Meanwhile, for the posttest, sig = 0.079 > 0.05, which means H_0 is accepted. This indicates that the dataset comes from a normal population. Based on data calculations, it is proven that the student pretest-posttest score data on the large group test comes from a normal population. Because it is normally distributed, it can be continued with a homogeneity test. The results of the Homogeneity test in the Small Group Trial were using the Levene Statistics test assisted by SPSS version 26.0. Based on the output above, the value of sig = 1,000 > 0.05 means H_0 is accepted so that the two data exhibit homogeneity.

Table 2. Small Group Normality Test Results

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Pretest	0.172	6	0.200*	0.912	6	0.452
Posttest	0.122	6	0.200*	0.982	6	0.961

Table 3. Large Group Normality Test Results

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Pretest	0.169	25	0.064	0.943	25	0.174
Posttest	0.131	25	0.200*	0.928	25	0.079

Homogeneity Test Results in Large Group Trials using the homogeneity test above were carried out using the Levene Statistics test assisted by SPSS version 26.0. Based on the output above, the value of sig = 0.507 > 0.05 is obtained, so H0 is accepted so that both data show homogeneity. These results indicate that the data is normal and homogeneous so continue to carry out the T-test. The results of the T test in small groups are presented in Table 4.

Table 4. Small Group T-Test Results

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pretest - Posttest	-26.667	6.831	2.789	-33.836	-19.498	-9.562	5	0.000

The results of data analysis show that the average difference between the pretest and posttest using SPSS version 26.0 with a sig (2-tailed) value is 0.000. In the Paired Samples T-Test, the pretest and posttest scores have a clear difference in student learning gains, if sig. (2-tailed) value <0.05. Meanwhile, if sig. (2-tailed) > 0.05, no substantial pre-post differences were observed in learning gains. From the t test results above, sig.(2-tailed)=0.00. It is known that the sig (2-tailed) value is 0.000 < 0.05, t rejection of H0 indicates that there are quite large differences in learning outcomes which are reflected in the pre - post test scores of the small group. Large Group T-Test Results are presented in Table 5.

Table 5. Large Group T-Test Results

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pretest - Posttest	-25.200	9.183	1.837	-28.991	-21.409	-13.721	24	0.000

From the results of the t-test in the large group, it can be seen that the average difference between the pretest and posttest using SPSS version 26.0 with a sig (2-tailed) value is 0.000. In the Paired Sample T-Test, there is a real difference in learning outcomes between the pretest and posttest scores if sig. (2-tailed) value <0.05. Meanwhile, if sig. (2-tailed) > 0.05, the pretest score is similar to the post-test score, thus indicating limited learning improvement. From the t-test output above, sig is obtained. (2-tailed) = 0.000. It is known that the sig (2-tailed) value is 0.000 < 0.05, H0 is rejected indicating a striking difference in learning outcomes, as shown by the pre-post test scores of the large group. Based on the SPSS output in the Small Group, the N-Gain Score = 0.6141. Based on the normalized gain criteria, the value of N Gain Score = 0.6141 is in the interval 0.3 < g < 0.7, which means that the student's score in the small group trial is included in the medium criteria. Based on the SPSS output in the Large Group Trial, the N Gain Score = 0.6019. Based on the normalized gain criteria, N Gain Score = 0.6019 is below the interval 0.3 < g < 0.7, which means that students' score increase in large group trials is included in the medium criteria.

Discussion

This research shows that the Card Match Circle learning media received very good qualifications from experts. This shows that the Card Match Circle learning media is suitable for learning due to several factors. First, the Card Match Circle learning media is suitable for use in learning because it can improve student learning outcomes. Card Match Circle media is a card-shaped tool that can convey information. Cards are solid, slim, and flat objects made from sturdy paper. This card attracts students' interest and increases their learning motivation, in line with the educational goals set (Amini & Suyadi, 2020; Nurmalasari et al., 2022). The use of card media in educational activities aims to develop students' understanding through text and images on the cards, as well as to increase students' interest in learning to increase the efficiency of educational activities (Estiani et al., 2015; Nida et al., 2020; Rahmawati et al., 2019). The Card Match Circle learning tool includes cards in text and images and is modified into a game (Chusna & Wahyuningtyas, 2020; Pratomo et al., 2020). The advantage of using picture card media in educational activities is that it makes it easier to understand the material and conveys information more visually, but is more impressive and easy to remember without using too much verbal language (Artini et al., 2016; Pratomo et al., 2020). The Card Match Circle tool can help teachers convey learning material information to students and help students understand the learning material presented by educators. This makes the Card Match Circle learning media suitable for use in learning because it can improve student learning outcomes.

Second, the Card Match Circle learning media is suitable for use in learning because it can make it easier for students to learn. This media uses cards in the form of images that have been modified into games using circle carpets, rounds, question cards, challenge cards, and answer cards. The advantage of using picture card media in the learning process is its ability to explain and convey ideas, messages, and information more visually and impressively without relying too much on verbal language (Astuti, 2021; Lestari et al., 2021; Oktafyani et al., 2022). Card Match Circle can be a powerful tool to make it easier for students to learn and help their psychological development (Ma'rifah et al., 2015; Sirait & Apriyani, 2020). The theory that supports the use of this media is constructivism theory, students will be directly involved during educational activities using the circle card match game. Students can also interact actively with learning material through card match circle learning tools (Astuti, 2021; Fatmawati & Harmanto, 2019; Lestari et al., 2021; Oktafyani et al., 2022). This learning media facilitates students' understanding of the material through question and answer, challenges, and problem-solving. Therefore, the card game circle proved to be a valuable tool for effective fifth-grade science learning. Its use can be an innovative and exciting solution for educators in presenting material and providing opportunities for students to develop their knowledge more easily (Sari et al., 2023; Wahyuningtyas & Zulherman, 2022).

Third, the Card Match Circle learning media is suitable for learning because it can increase students' learning motivation. The Card Match Circle game allows students to participate in learning actively. Students can choose the card that corresponds to the correct answer, compare pictures, and understand concepts in a more interactive and fun way (Annisa & Marlina, 2019; Wahyuningtyas & Zulherman, 2022). The product of this research is Card Match Circle learning media, which consists of spins, question cards, answer cards, challenge cards, and answer boards. The Card Match Circle learning media uses the concept of learning while playing to make the learning process more exciting (Ma'rifah et al., 2015; Sirait & Apriyani, 2020). Research shows that learning while playing effectively develops elementary school students' abilities according to their competencies (Mustikah et al., 2023; Yatini, 2021). The card match circle was designed or designed using the Canva application and then validated by media experts and material experts to test its feasibility. The validation results show that the Card Match Circle learning tool suits class V IPAS learning about Indonesian flora and fauna. Previous research findings state that the use of learning media has a vital role because, in educational activities, material that is difficult to understand will be easier to understand through the application of learning media as an interface for delivering material (Daryono et al., 2021; Mertasari & Ganing, 2021; Pinatih et al., 2021). Other research also states that teachers as educators must have learning tools that are in line with the characteristics of elementary school students in the form of games, inviting students to move, study, or work in groups, and involving students directly during learning activities (Biassari et al., 2021; Saputra & Putra, 2021). The advantage of this media is that the Card Match Circle learning media can encourage the educational atmosphere to become more lively and enjoyable (Ma'rifah et al., 2015; Mustikah et al., 2023; Sirait & Apriyani, 2020). Students can directly use this media so that it can facilitate their understanding of the material during educational activities. The limitation of this research is that the media developed is only intended for class V, especially regarding the diversity of Indonesian flora and fauna. This research implies that the development of Card Match Circle learning media can be used to support learning activities. Card Match Circle learning media can help students to be active.

4. CONCLUSION

Based on the research that has been carried out, results were obtained in the form of circle card match media in class V science material about the diversity of Indonesian flora and fauna which has been tested for its suitability. The resulting media obtained a percentage of eligibility within the criteria of being very suitable for use. The t-test results showed fundamental differences in learning outcomes, as evidenced by the students' scores in small and large groups before and after the test. The results of the N-gain test show that the increase in student learning outcomes in small-group and large-group experiments is included in the medium criteria. It was concluded that the circle card match media in class V science material is feasible and effective for improving student learning outcomes.

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