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The Use Of Flash Card Media In Improving Science Learning Outcomes In Elementary School Students

Penggunaan Media Flash Card Dalam Meningkatkan Hasil Belajar IPA Pada Siswa Sekolah Dasar

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ABSTRACT

This study aims to determine the use of flash card media in improving science learning outcomes of grade IV students at SDN 09 Kepahiang. This study is a quantitative research with a Quasi Experimental design that aims to test the effectiveness of Flash Card media on the science learning outcomes of grade IV students of SDN 09 Kepahiang. The study involved two groups an experimental group using a Flash Card and a control group using conventional learning methods. The sample consisted of 40 students who were selected purposively, 20 students each in grades IV A and IV B. Data was collected through observation, documentation, and tests in the form of pre-test and post-test. The research instrument was in the form of multiple-choice questions that had been tested for validity (21 valid questions out of 25), reliability (coefficient of 0.758), and difficulty level (the majority of questions were classified as easy to moderate). Data analysis began with a prerequisite test in the form of normality (Chi-Square) and homogeneity (F-test) tests, then continued with hypothesis tests using independent sample t-tests. The results of the analysis aimed to determine the significance of the difference in learning outcomes between students who learned using Flash Cards and those who did not. The findings in the study are that the use of Flash Card media is significantly effective in improving the learning outcomes of science subjects for grade IV students. This is shown by an increase in the average posttest score of the experimental class by 37.75 points to 82.25, which is higher than that of the control class which only increased by 28.5 points with an average of 71.75. The t-test showed statistically significant results (t count = 3.441 > t table = 2.021 at 5%), confirming that the difference in learning outcomes between the two classes did not occur by chance. Flash Cards are proven to help students understand abstract and factual concepts of science through attractive visual presentations and the use of keywords that make it easy to remember. In addition, the interactive nature of this media also increases students' active involvement in the learning process. Thus, Flash Cards not only play a role as a tool, but also as an effective learning strategy in improving the quality of science education at the elementary school level.

Key words : Usage, Flash Card Media, Improving Learning Outcomes, Science, Elementary School Students

ABSTRAK

Penelitian ini bertujuan untuk mengetahui penggunaan media kartu flash (flash card) dalam meningkatkan hasil belajar IPA siswa kelas IV di SDN 09 Kepahiang. Penelitian ini merupakan penelitian kuantitatif dengan desain *Quasi Experimental* yang bertujuan untuk menguji efektivitas media kartu flash terhadap hasil belajar IPA siswa kelas IV di SDN 09 Kepahiang. Penelitian ini melibatkan dua kelompok, yaitu kelompok eksperimen yang menggunakan media kartu flash dan kelompok kontrol yang menggunakan metode pembelajaran konvensional. Sampel terdiri dari 40 siswa yang dipilih secara purposive, masing-masing 20 siswa dari kelas IV A dan IV B. Pengumpulan data dilakukan melalui observasi, dokumentasi, dan tes berupa pretest dan posttest. Instrumen penelitian berupa soal pilihan ganda yang telah diuji validitasnya (21 soal valid dari 25 soal), reliabilitasnya (dengan koefisien 0,758), dan tingkat kesulitannya (mayoritas soal tergolong mudah hingga sedang). Analisis data diawali dengan uji prasyarat berupa uji normalitas (uji Chi-Square) dan uji homogenitas (uji F), kemudian dilanjutkan dengan uji hipotesis menggunakan *independent sample t-test*. Hasil analisis bertujuan untuk mengetahui signifikansi perbedaan hasil belajar antara siswa yang belajar menggunakan kartu flash dan yang tidak. Temuan dalam penelitian ini menunjukkan bahwa penggunaan media kartu flash secara signifikan efektif dalam meningkatkan hasil belajar mata pelajaran IPA siswa kelas IV. Hal ini ditunjukkan dengan peningkatan rata-rata skor posttest kelas eksperimen sebesar 37,75 poin menjadi 82,25, yang lebih tinggi dibandingkan kelas kontrol yang hanya meningkat sebesar 28,5 poin dengan rata-rata 71,75. Uji t menunjukkan hasil yang signifikan secara statistik (t hitung = 3,441 > t tabel = 2,021 pada taraf 5%), yang mengonfirmasi bahwa perbedaan hasil belajar antara kedua kelas tidak terjadi secara kebetulan. Media kartu flash terbukti membantu siswa dalam memahami konsep-konsep abstrak dan faktual dalam IPA melalui penyajian visual yang menarik dan penggunaan kata kunci yang memudahkan untuk diingat. Selain itu, sifat media yang interaktif juga meningkatkan keterlibatan aktif siswa dalam proses pembelajaran. Dengan demikian, kartu flash tidak hanya berperan sebagai alat bantu, tetapi juga sebagai strategi pembelajaran yang efektif dalam meningkatkan kualitas pendidikan IPA di jenjang sekolah dasar.

Kata Kunci **:** *Penggunaan, Media Flash Card, Meningkatkan Hasil Belajar, IPA, Siswa SD*

INRODUCTION

The implementation of learning media in the education process in Indonesia has become an important aspect in improving the quality of learning. Learning media functions as visual, audio, and audiovisual aids that are able to bridge students' understanding of the subject matter (Arief, 2021), especially in explaining abstract or complex concepts. In practice, various media such as learning videos, images, animations, teaching aids, and digital platforms such as educational applications and Learning Management Systems (LMS) have been used by teachers to enrich teaching methods (Novel et al., 2024). The implementation of this media has a positive impact on learning motivation, student involvement, and a deeper understanding of concepts (Utomo, 2023). Especially with the introduction of the Merdeka Curriculum that encourages project-based learning and hands-on experience, learning media has become an effective means to adapt learning to the needs and learning styles of students (Cahyanto, Badaruddin, et al., 2024).

The use of learning media in the teaching and learning process has a very important role in improving student learning outcomes (Susilo, 2020). Learning media functions as a tool

that facilitates the delivery of subject matter in a clearer, more interesting, and easier to understand by students (Nurrita, 2018). With the right media, difficult and abstract concepts can be transformed into more concrete and visual information so as to increase students' absorption (Kusum et al., 2023). In addition, learning media is also able to stimulate students' various senses such as sight and hearing, which helps strengthen their memory and understanding of the material (Sumiharsono & Hasanah, 2017). This directly contributes to increasing students' learning motivation, interest, and active involvement during the learning process.

In addition to increasing understanding and motivation, the use of varied learning media also supports the creation of a more interactive and fun learning atmosphere (Ginting et al., 2024). Media such as images, videos, props, and digital media can facilitate more innovative learning methods, such as group discussions, simulations, and educational games. Thus, students are not only passive listeners, but active participants involved in the learning process. This increased involvement has a positive impact on critical thinking skills, creativity, and the application of concepts in daily life, which ultimately improves overall learning outcomes. Therefore, effective integration of learning media is one of the main keys in efforts to improve the quality of education and student learning outcomes.

The use of learning media in improving the learning outcomes of Natural Sciences (IPA) in elementary schools (SD) is very crucial considering the characteristics of science material which is often abstract and complex for early childhood students (Ansya & Salsabilla, 2024). Learning media such as images, three-dimensional models, videos, and interactive media (Israwati & Hasanuddin, 2024) Like flash cards, it can help visualize scientific concepts so that students can more easily understand and remember the material being taught. With interesting media and in accordance with the level of cognitive development of elementary school students, the learning process becomes more active, fun, and interactive, which directly increases students' motivation and interest in learning science (Oktafiani et al., 2020). In addition, the right learning media also allows teachers to present material in a varied and contextual manner (Riyana, 2012), so that students can relate science concepts to real experiences in daily life. This not only deepens students' understanding, but also has a positive impact on significantly improving science learning outcomes.

However, what happens is the problem of low student learning outcomes in science subjects at the elementary school level is a complex issue and requires special attention. Science as a subject oriented to understanding natural concepts and scientific processes is often found difficult by students because of its presentation that is too theoretical and lacks visualization (Dewi, 2018). When teachers rely only on lecture methods and textbooks, students tend to be passive listeners, not active participants in the learning process. Material

that should be understood through real experience or visual approaches often cannot be absorbed optimally, especially by students who have visual and kinesthetic learning styles.

The lack of concrete and interactive learning media exacerbates the situation, as elementary school-age students are at the stage of concrete operational cognitive development, where they are more likely to understand information if it is presented in real form, images, or visual aids (Cahyanto, Majid, et al., 2024). Concepts in science such as changes in the form of substances, food chains, or respiratory systems, will be easier to understand if they are presented through an interesting medium that is in accordance with the characteristics of child development. However, there are still many teachers who have not made the most of learning media, both due to limited resources and lack of training in the development of learning media that suits the needs of students (Badaruddin, 2024).

Therefore, the use of learning media such as flash cards can be an effective and efficient alternative in bridging students' understanding of science materials. Flash cards containing images, keywords, and brief explanations can help students visually recognize concepts and strengthen memory through a fun process of repetition (Tapilouw et al., 2025). In addition, flash cards allow for more participatory learning activities, such as educational games, questions and answers, or small group discussions, that encourage students to be active and directly involved in learning (Fuadhi et al., 2025.). Thus, the use of media such as flash cards is not only a complement, but also an important part of a learning strategy that is able to increase the interest, understanding, and learning outcomes of science students as a whole.

Flash card media is one of the potential solutions to overcome this problem. With an attractive visual design and a concise and easy-to-understand presentation of information, flash cards are able to help students recognize and remember science concepts more effectively (Setiawati et al., 2015). Unfortunately, the use of this media in science subjects is still relatively minimal and not evenly distributed in all elementary schools. Many teachers have not developed or used flash cards as part of their learning strategies, either due to limited knowledge, skills, or resources. Therefore, it is important to examine more deeply how the use of flash cards can make a real contribution to improving the science learning outcomes of elementary school students, as well as encouraging teachers to adopt a more varied and innovative learning approach.

The results of the analysis of various literature show that the use of flash card media in learning has been widely researched and proven to be effective in improving students' cognitive abilities, especially in the recognition of letters, numbers, and vocabulary at the early childhood and elementary school education levels. However, there is a gap in the literature related to the application of flash card media specifically in Natural Sciences (IPA) learning. Most of the research focuses more on Indonesian and Mathematics subjects, while studies on

the effectiveness of flash cards in helping to understand science concepts are still limited. In fact, science materials in elementary school also require concrete and visual media that are able to bridge students' understanding of abstract concepts, such as the water cycle, the classification of living things, or the food chain.

In addition, the literature review also revealed that the application of flash cards not only serves as a memorization aid, but also as a medium that encourages student interaction and participation during the teaching and learning process (Maulida, 2018). Flash cards can be used in a variety of learning methods, such as questions and answers, quizzes, and educational games that appeal to elementary school students (Sofirin et al., 2025). This is in line with the principles of active and constructivist learning that emphasize the direct involvement of students in building knowledge (Badaruddin et al., 2024). However, the effectiveness of flash cards is highly dependent on the design of media that is attractive and relevant to the material and the teacher's ability to integrate it into learning strategies. Therefore, the development and use of flash cards as a science learning medium needs to be encouraged to improve the quality of basic education in Indonesia.

The conditions that occur in grade IV students of SDN 09 Kepahiang experience difficulties in learning Natural Sciences (IPA) caused by the characteristics of the material which are indeed quite complex and abstract. Science materials such as the water cycle, respiratory system, and classification of living things contain concepts that require a deep understanding and interconnectedness between concepts. However, the delivery of material, which has relied more on lecture methods and textbooks, makes the learning process less effective for students. This one-way method does not provide enough space for students to actively interact or explore the material (Lestari, 2020). As a result, many students find it difficult to understand the material completely and deeply, so they easily lose focus and interest in science lessons.

Difficulties in understanding the material also have a direct impact on the low learning outcomes of students (Rismawati et al., 2020). Because the material presented is difficult to digest, students experience obstacles in remembering and applying science concepts in daily life or in the context of learning. This causes the learning process to be less interactive and less involving students' active participation. When students are only passive listeners, their motivation to learn tends to decrease, so they are less enthusiastic about following the lessons. This condition shows the need for more innovative and interesting learning approaches and media so that students can more easily understand conceptual science material, so that their learning outcomes and interest in this subject can increase (Supardi, 2017).

To overcome challenges in science learning, it is very important to provide stimuli that are able to make the learning process more interesting and effective so that learning goals

can be achieved properly (Huda, 2024). The success of science learning does not only depend on the competence and quality of teachers, but is also greatly influenced by the use of appropriate learning media during the teaching and learning process in the classroom (Kahfi & Srirahayu, 2021). Good learning media is able to bridge students' understanding of abstract and complex material in a more concrete and interactive way (Ali et al., 2024). With the right media, students can more easily understand concepts, feel more interested, and be motivated to be active in the learning process, so that learning outcomes are increased.

One of the recommended media in science learning is flash card media. This medium is considered effective because it presents material in the form of cards that contain pictures, words, or symbols that are concise and easy to understand. Flash cards make it easier for students to remember and master science concepts through visual stimulation and fun repetition. Additionally, the use of flash cards can create a more interactive learning atmosphere, where students can engage in various activities such as educational games, questions and answers, and group discussions (Arsyaf et al., 2022). Thus, flash card media not only helps teachers in delivering material, but also encourages students to learn actively and creatively, so that the science learning process becomes more effective and student learning outcomes can increase significantly.

Based on the description above, the researcher is interested in conducting a research entitled "The Use of Flash Card Media in Improving Science Learning Outcomes of Grade IV Students at SDN 09 Kepahiang"

METHOD

This research is a type of quantitative research (Ramdhan, 2021) that aims to test hypotheses scientifically through numerical data analysis. The design used was *Quasi* Experimental Design (Abraham & Supriyati, 2022), which involved two groups the experimental group and the control group without full randomization. The experimental group was given treatment in the form of using Flash Card media in the learning process, while the control group continued to use conventional learning methods. The selection of this design was based on the limitations of strictly controlling external variables, but still allowed the researcher to objectively observe the effect of treatment on learning outcomes. To measure the effectiveness of the treatment, data was collected through pre-tests and post-tests that compared learning outcomes between the two groups.

This research was carried out at SDN 09 Kepahiang. The population in this study includes all students of SDN 09 Kepahiang which totals 268 people. Of these, 40 students were selected as research samples, consisting of 20 students in class IV A as the experimental group and 20 students in class IV B as the control group. The sampling technique used purposive sampling (Lenaini, 2021), with the consideration that class IV A had relatively low learning outcomes, so it was considered appropriate to be treated. The data collection

techniques in this study include direct observation of the implementation of the learning process, documentation in the form of collecting lesson plans, photos of activities, and other supporting documents, and tests consisting of pre-tests and post-tests to measure the improvement of student learning outcomes in science materials, especially about the classification of animal types based on their diet (herbivores, carnivores, and omnivores).

The research instrument used is in the form of objective test questions that have been tested for quality in terms of validity, reliability, and level of difficulty. The validity test was carried out with the Product Moment formula from Pearson (Gooch, 2011), and out of the 25 questions tested, 21 questions were declared valid. For example, question number 1 has a correlation coefficient rxy=0.611r_{xy} = 0{,}611rxy=0.611, greater than rtable=0.444r_{table} = 0{,}444rtable=0.444, so it is declared valid. The reliability test using the split-half technique with the Spearman-Brown formula (Walker, 2005) yielded a coefficient of 0.758, which indicates a fairly high consistency of the instrument. Meanwhile, based on the difficulty level analysis, most of the questions are relatively easy (17 questions with an example P = 0.85) and medium (8 questions with an example P = 0.65), so the overall questions are suitable for measuring student learning outcomes.

In analyzing the data, the researcher first conducted a prerequisite test which included a normality test and a homogeneity test (Priyatno, 2011). The normality test was carried out using the Chi-Square test to ensure that the data was distributed normally, while the homogeneity test was carried out with the F test to find out whether the variance of the two groups was homogeneous. After meeting the prerequisite test requirements, the analysis was followed by a hypothesis test using an independent sample t-test to compare the average post-test results between the experimental group and the control group. The calculation in this test considers the variance and the number of samples from each group to find out whether there is a statistically significant difference in the learning outcomes of students who are treated using Flash Card media compared to those who do not.

RESULTS AND DISCUSSION

Results

This research was carried out with the aim of determining the effectiveness of the use of Flash Card media in improving the learning outcomes of Natural Sciences (IPA) subjects for grade IV students at SDN 09 Kepahiang. The research method used is Quasi Experimental Design with a Nonequivalent Control Group Design type of design. In this design, there are two groups that are not randomly selected, namely the experimental group and the control group. The experimental group (class IV A) consisted of 20 students who received learning using Flash Card media, while the control group (class IV B) which also consisted of 20 students, followed conventional learning without using the media. Data was collected through

pretest and posttest to determine changes and improvements in learning outcomes before and after treatment.

Before the treatment was given, the two groups were tested first with a pretest to find out the students' initial abilities. The results of the pretest showed that the average score of Class A (Experimental Class) was 44.5 with a standard deviation of 6.7. Based on the ability category, as many as 15% of students were in the high category (score ≥51.2), 65% of students were in the medium category (score between 37.8–51.2), and 20% of students were in the low category (score ≤37.8). This shows that the majority of students in the experimental class have early abilities at a moderate level, but with the potential to be improved through appropriate learning treatment. This can be seen in the table below:

Table 1. Pretest Results for Class A (Experimental Class)

Grade Categories	Value Range	Frequency	Percentage
Tall	> 51.2	3	15%
Keep	37,8 - 51,2	13	65%
Low	< 37.8	4	20%

Meanwhile, the results of the pretest in Class B (Control Class) showed an average score of 43.25 with a standard deviation of 7.4. The distribution of students' abilities in this class consisted of 10% of students in the high category (score ≥50.65), 65% of students in the medium category (score 35.85–50.65), and 25% of students in the low category (score ≤35.85). When compared to the experimental class, the distribution of the two groups' initial abilities showed no significant difference. This is important because it shows that both classes have a relatively equal level of ability before treatment, so that the comparison of learning outcomes after treatment can be done fairly and objectively. This can be seen in the table below:

Table 2. Pretest Results for Class B (Control Class)

Grade Categories	Value Range	Frequency	Percentage
Tall	> 50.65	2	10%
Keep	35,85 - 50,65	13	65%
Low	< 35.85	5	25%

After the treatment is given during a certain learning period, a posttest is carried out to assess the improvement in student learning outcomes. The posttest results in the experimental class showed a significant improvement, with an average score of 82.25 and a standard deviation of 10.0. The distribution of ability after treatment showed that 15% of students were in the high category (score ≥92.25), 65% of students were in the medium

category (score 72.25–92.25), and 20% of students were still in the low category (score ≤72.25). This shows that most students experience an improvement in ability to moderate and high levels after using Flash Card media in the learning process.

Table 3. Posttest Results for Class A (Experimental Class)

Category	Value Range	Frequency	Percentage
Tall	> 92,25	3	15%
Keep	72,25 – 92,25	13	65%
Low	< 72,25	4	20%

Meanwhile, the posttest results in the control class that did not use Flash Card media showed an average value of 71.75 with a standard deviation of 8.6. The distribution of students' abilities consisted of 15% in the high category (score ≥80.35), 70% in the medium category (score 63.15–80.35), and 15% in the low category (score ≤63.15). Although there was an increase compared to the pretest score, the average increase in the score in the control class was not as large as the experimental class. The experimental class experienced an average increase of 37.75 points, while the control class only experienced an increase of 28.5 points.

Table 4. Posttest Results for Class B (Control Class)

Category	Value Range	Frequency	Percentage
Tall	> 80,35	3	15%
Keep	63,15 – 80,35	14	70%
Low	< 63.15	3	15%

When compared, the average score increased by +37.75 for class IV A and +28.5 for class IV B from pretest to posttest. This shows that students who study with Flash Cards experience a more significant improvement in learning outcomes.

Table 5. Average score from pretest to posttest

Class	Rat-rata Pretest	Rate-Rate Posttest	Difference
IV A	44,5	82,25	+37,75
IV B	43,25	71,75	+28,5

To test the validity and reliability of the data obtained, a series of statistical tests were carried out. The normality test in this study aims to find out whether the pretest and posttest value data from the experimental class (IV A) and the control class (IV B) are distributed normally. The test was performed using the Chi-squared (χ^2) method, which compares the calculated χ^2 value with the χ^2 table. Based on the calculation results, the χ^2 value of the

calculation was obtained of 0.7984, while the value of χ^2 of the table at the significance level of 0.05 with a degree of freedom (dk) 4 was 9.487. Since χ^2 is calculated < χ^2 table (0.7984 < 9.487), it can be concluded that there is no significant difference between the observed data distribution and the expected normal distribution.

Thus, the pretest and posttest data from both groups in this study meet the normality requirements. Normal data distribution is one of the important prerequisites in parametric statistical analysis, such as the t-test used in this study. This provides a solid basis that the data used can be further validly analyzed and the results of hypothesis testing will have a high level of reliability. Therefore, the results of this normality test support the continuation of the research to the hypothesis test stage, which is to compare the effectiveness of Flash Card media on improving student learning outcomes.

The homogeneity test in this study was carried out to find out whether the data from the two groups, namely the experimental class (IV A) and the control class (IV B), had the same variance or not. This test is important before proceeding to the t-test, because one of the requirements of the t-test is that the two groups must be homogeneous or have similar data diversity. The method used is the F (Fisher) test, which compares the value of the F calculation with the F of the table at a significance level of 5% with a degree of freedom of 19 (n-1) each. Based on the calculation results, F calculation = 1.15 was obtained**,** while F table = 4.38. Since F counts < F tables, it can be concluded that both groups have homogeneous variance.

The conclusions of this homogeneity test show that the data from the experimental and control classes have a comparable level of value distribution, so they are statistically valid for comparison. This homogeneity corroborates that the differences in learning outcomes found later are not caused by variations or irregularities in the data, but by the treatment given, namely the use of Flash Card media. Thus, the homogeneity test plays an important role in ensuring the validity and objectivity of further analysis, as well as supporting the internal validity of this research.

In this study, the researcher established two hypotheses, namely

1. A zero hypothesis (H_0) which states that the use of Flash Card media cannot improve the science learning outcomes of grade IV students at SDN 09 Kepahiang, and
2. An alternative hypothesis (H_a) that states that the use of Flash Card media can improve the learning outcomes of science students in grade IV at SDN 09 Kepahiang.

To test the validity of the hypothesis, the researcher used a statistical analysis of the t-test of two independent samples, which aimed to find out whether there was a significant difference between the value of student learning outcomes in the experimental class and the control class after being given different learning treatments.

Based on the calculation results, t calculation was obtained of 3.441, while t table at the significance level of 5% with the degree of freedom (df) = 38 was 2.021. Since t calculates > t table (3.441 > 2.021), H_0 is rejected and H_a is accepted**.** The conclusion of this t-test is that the use of Flash Card media in science learning has a real positive influence on improving student learning outcomes. The significant difference in the average posttest score between the experimental class (82.25) and the control class (71.75) strengthened the results. Therefore, an alternative hypothesis (Ha) in the study was accepted, which states that the use of Flash Card media is able to improve student learning outcomes compared to learning without media. This means that statistically there is a significant difference in learning outcomes between students who learn using Flash Card media and students who do not use the media. Thus, it can be concluded that the use of Flash Card media has proven to be effective in improving the learning outcomes of science students in grade IV at SDN 09 Kepahiang.

The results of the t-test conducted in this study showed that there was a significant difference between the learning outcomes of grade IV A students (experimental group) who used Flash Card media and students of grade IV B (control group) who did not use the media. The average posttest score for class IV A is 82.25, while the average for class IV B is 71.75, so there is a difference of 10.5 points. This difference shows that students who study with the help of Flash Cards are able to achieve a better understanding of science material than students who study without the media. Thus, the use of Flash Cards has proven to be effective in improving the quality of learning and student learning outcomes.

The effectiveness of Flash Cards in science learning can be explained through their ability to present information visually and attractively. The pictures and keywords on the cards help students remember concepts, improve focus, and stimulate active involvement in the learning process. This is very important, especially in science learning which requires an understanding of abstract concepts and factual knowledge. Therefore, the difference in learning outcomes between the two classes is a strong indicator that Flash Cards are not just a tool, but also a learning strategy that can have a real impact on the achievement of student learning outcomes.

Discussion

This study aims to determine the effectiveness of Flash Card media in improving student learning outcomes in Natural Sciences (IPA) grade IV SDN 09 Kepahiang. From the results of the study, it was found that students who used Flash Card media showed a more significant improvement in learning outcomes compared to students who used conventional learning methods. This is shown by the difference in the average posttest scores between the experimental and control classes, of 82.25 and 71.75, respectively.

This difference in learning outcomes increases shows that Flash Card media is able to create more interesting and meaningful learning. As stated by Sadiman Arief, (2009), learning media such as Flash Cards serve to clarify the presentation of messages, increase student attention, and provide a more concrete learning experience. In the context of science, which requires an understanding of scientific concepts, the use of Flash Cards is very supportive in building this understanding visually.

In the learning process, students need media that is able to help them understand new information in a way that suits their learning style. Flash Cards present material in an attractive and concise visual form, thus helping students to remember and understand concepts more efficiently. This is in line with Dale's, (1969) theory in his Audio visual methods in teaching, which states that learning will be more effective if it uses a concrete medium that is directly experienced by students.

Piaget's theory of the stages of cognitive development is also relevant to explain the results of this study. According to Piaget, elementary school students are in the concrete operational stage, where they learn best through the manipulation of real objects. Flash Cards that present images and short text are the right tools to support learning at this stage. With this medium, students not only see, but also can manipulate and interact directly with the subject matter.

In addition, learning that uses visual media such as Flash Cards can increase students' motivation to learn, (Slavin, 2016) posits that students' intrinsic motivation increases when they are actively involved in fun and challenging learning. In this study, the use of Flash Cards provides an interactive and not boring learning variety, so that students are more focused and enthusiastic about participating in lessons.

From a behavioristic psychology point of view, the use of Flash Cards is also very appropriate. Skinner explains that the learning process occurs as a result of the stimulus-response relationship. The Flash Card provides a stimulus in the form of an image or keyword, and students respond by answering or remembering related information. This process is reinforced by repetition, which systematically strengthens students' memory of the material.

The use of this media also supports active learning. According to (Silberman, 2016), learning will be more effective if students are actively involved, both physically, mentally, and emotionally. Flash Cards provide students with the opportunity to practice, discuss, and play while learning. This activity creates a dynamic learning atmosphere and increases interaction between students as well as between teachers and students.

Based on the statistical tests conducted in the study, both the normality and homogeneity tests showed that the data were eligible for parametric tests. The results of the t-test showed that there was a significant difference between the learning outcomes of students who used Flash Cards and those who did not. This reinforces the internal validity of

the research and provides evidence that the use of appropriate learning media has a direct impact on the achievement of learning outcomes.

In science learning, a lot of the material is abstract, such as changes in the shape of objects, the respiratory system, or the water cycle. These materials require visual aids so that students can imagine and understand these concepts. Flash Cards provide simple and easy-to-understand visual representations, helping students connect abstract information with reality.

The learning approach using Flash Cards is also in line with the principles of constructivism-based learning. This theory, which was pioneered by Vygotsky et al., (2018) and Bruner, (1999), emphasizing the importance of active learning experiences and the role of media in helping students build their own knowledge. Flash Cards not only convey information, but also encourage students to think, remember, and connect new information with previous knowledge.

Another advantage of using a Flash Card is its flexibility and ease of implementation. Teachers can make their own Flash Cards according to the needs of the material and the characteristics of the students. In addition, these media are easy to use in both individual, small group and classical learning activities. This gives teachers the freedom to design varied learning strategies.

This research has important implications for the world of education, especially at the elementary school level. In today's digital era, where students tend to get bored of traditional learning methods faster, the use of media such as Flash Cards is becoming an effective, inexpensive, and accessible alternative solution. This media can be used offline or combined with digital technology to create hybrid learning.

Although the results of the study show significant effectiveness, the application of Flash Card media should not be done in a monotonous manner. According to Heinrich et al., (2019), the selection of media must be tailored to the learning objectives, student characteristics, and the context of the learning environment. Therefore, teachers still need to evaluate and combine Flash Cards with other methods such as experiments, simulations, or learning videos for more optimal results.

Support from school principals, fellow teachers, and training on the use of learning media also plays an important role in the successful implementation of Flash Cards. Teachers need a good understanding of how to design and utilize Flash Cards so that teachers' professional development is an aspect that cannot be ignored.

By considering all of the above aspects, it can be concluded that the use of Flash Cards as a learning medium in science subjects has proven to be effective in improving student learning outcomes. These media not only significantly increase students' academic grades, but also provide an enjoyable learning experience, build learning motivation, and

support students' active involvement in the learning process. Therefore, Flash Cards deserve to be continuously developed and made part of innovative learning strategies in elementary schools.

CONCLUSION

Based on the results of research conducted at SDN 09 Kepahiang, it can be concluded that the use of Flash Card media has proven to be effective in improving the learning outcomes of Natural Sciences (IPA) subjects for grade IV students. This is evidenced by the results of the posttest which showed a significant increase in the experimental class (using Flash Card) compared to the control class (conventional learning). The average posttest score of the experimental class was 82.25, an increase of 37.75 points from the pretest score, while the control class only increased by 28.5 points with an average posttest of 71.75. The t-test of two independent samples yielded a t-count of 3.441 which is greater than the table t-count of 2.021 at a significance level of 5%, which means that the difference in learning outcomes between the two classes is statistically significant.

A significant increase in learning outcomes in the experimental class indicates that Flash Cards are able to improve students' understanding of abstract and factual science concepts. This media helps students by presenting information visually and attractively through images and keywords that make the memory process easier. In addition, students' active involvement in learning also increases due to the interactive nature of the Flash Card media. With these results, it can be concluded that Flash Cards are not just a teaching tool, but an effective learning strategy to improve the quality of education, especially in science subjects at the elementary school level.

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