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# The Effectiveness of the Circ Model with the Help of Flashcard Media on the Learning Outcomes of Science Class V

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**Abstract**

*Purpose:* This study evaluates the effectiveness of the Cooperative Integrated Reading and Composition (CIRC) model supported by flashcard media in improving science learning outcomes for class VA students at MI Muhammadiyah Gonilan.
*Methodology:* Using A Pre-Experimental One Group Pre-Test and Post-Test Design, The Sample Included 29 Students. Data Collection Involved Tests (Pre-Test and Post-Test) and Interviews With The Class Teacher. The Data Were Analyzed Using Normality, Homogeneity, Paired Sample T-Test, and N-Gain Tests.
*Results:* Results Indicate Moderate Effectiveness, With A T-Test Value Of 19.239 > 2.048 Showing Significant Differences Between Pre-Test and Post-Test Scores. The N-Gain Score Of 68.65% Falls In The Medium Category.
*Applications/Originality/Value:* The Findings Suggest That the CIRC Model With Flashcard Media Moderately Improves Learning Outcomes and Highlights The Potential For Innovative, Easily Implemented Teaching Strategies To Enhance Classroom Learning.

## Introduction

The establishment of an independent curriculum brings changes to science and social studies subjects which are merged into IPAS. Learning IPAS has various bene-fits such as being ready and responsive to all changes and developments in the sur-rounding life. This is in accordance with the purpose of IPAS to develop inquiry, understand oneself and phenomena that occur in the student's environment (Rahman & Fuad, 2023). Science and technology learning should be introduced to students starting from elementary school. IPAS is also considered indispensable in the devel-opment of students in today's era. IPAS learning will integrate how to protect and maintain nature with social empathy and sympathy in the community (Marwa et al., 2023). With learning that brings them closer to nature and social, it will make stu-dents understand better because teachers can exemplify phenomena that occur in the nature around students. The concept of learning science is also considered to be able to provide experience for students and to improve students' abilities (Mazidah & Sartika, 2023). However, this research will focus on the science of digestive organ material in humans. It can be interpreted that it will focus on science learning, where this science learning can develop scientific attitudes and then be associated with theory in a person's daily life (Irviana, 2020). Therefore, researchers are interested in this material because students often snack carelessly without thinking about the health of their digestive organs. This is in accordance with the results of observa-tions when in elementary school, many students snack on fried foods with red sauce and ice that has various flavors. Therefore, it is necessary to learn about the human digestive organs about their function and also how to maintain them.

In the learning process for elementary school students, it is still necessary to have a teacher who is patient and smart in understanding the condition of his stu-dents, especially in choosing a learning model. Of course, teachers must be careful in choosing learning methods and learning media. Both of these things need to be considered because they will have an impact on student learning outcomes later. As is the case with the learning model, where this must be considered by the teacher to adjust the learning process in the classroom. The existence of a learning model will make the learning process in the classroom more organized and structured because there are learning steps that must be considered. This learning model is a framework that has been prepared to implement the teaching and learning process in the class-room (Mawardi, 2018). The use of the learning model can also make students inter-ested in the material that will be presented by the teacher. The existence of a learn-ing model will also foster enthusiasm for students and will play an active role in learning (Erawati, 2022). The learning model that is often used is to collaborate with groups. With the right learning model, learning will not only transfer knowledge. This can happen because in education it is often considered that learning is only learning and has an impact on students' low learning outcomes (Elia & Nana, 2020). Learning models often used by teachers while teachingnamely PBL (Problem based learning) or PJBL (Project based learning). However, it should be noted that there is one cooperative learning model that is no less interesting, namely the CIRC model.

The CIRC learning model is a learning model that integrates reading and writ-ing where students will be provided with reading materials that can be used to find information. This CIRC learning model is a learning model developed by Slavin at the end of 1980. This learning model will master students starting from the accuracy of reading and also how to write down important information contained in reading materials. The CIRC learning model is a model that accommodates students to build students' reading and writing skills comprehensively (Eka et al., 2021). The applica-tion of this learning model emphasizes the accuracy of students when reading the reading materials provided. With the reading process, students will become more understanding, add insight and knowledge, not only that students will also benefit from the reading process (van Woudenberg, 2021). This CIRC cooperative learning model can be used as a learning resource for their friends and cooperative learning is considered very meaningful because students will become tutors with each other (Hasanah & Himami, 2021). As previously stated, many students like learning to-gether or group work. So this cooperative learning model can also be used to make students happy in participating in learning. By using the CIRC model, it can make it easier for students to understand science and science learning comprehensively.

The application of the CIRC learning model will make the learning atmosphere more directed because students will be directed to understand the content of the reading well (Intan Marviana et al., 2018). In the implementation of the CIRC model, there is a syntax of concept introduction, exploration and also publication that is expected for students to be able to understand reading with critical thinking. The main purpose of the application of the CIRC learning model is that students are asked to understand the readings provided using cooperative groups. The selection of this group will be carried out in a heterogeneous manner so that there will be no disputes that are so different. At the publication stage, group representatives should present in front of the class and be noticed by their friends. Group representatives who are able to present or cooperate well in learning activities are entitled to re-wards (Marlina., 2019). The use of the CIRC learning model is indeed a little com-plicated because teachers will be asked to find or make reading materials that are in accordance with the learning materials to be presented. However, apart from that, learning that invites students to work together in groups will improve communica-tion and interaction with others. In addition to learning models that can support stu-dent learning outcomes, it is also necessary to use media as a visual tool for teacher explanations.

Learning media is a tool used to support students' understanding to achieve good and complete learning outcomes. The use of teaching media in learning will certainly be a good functional value such as being an example in creating an effec-tive and efficient learning process (Gabriela, 2021). The use of learning media can also help teachers complete learning goals in the learning process. Teaching media is not only a handbook for teachers or students, but in developing this teaching me-dia can be as creative as the teacher. The use of media in the process of learning digestive organ material is very much needed because it will make it easier for stu-dents to understand the material because there will be pictures of each digestive organ. Real learning media will allow students to be interested in participating in the learning that will be delivered by the teacher (Linggarsari 2021). There is one teach-ing media that can be made by teachers because it is easy to make and the materials used are also easy to find, namely Flashcard media. Flashcard media is a small card-shaped media in which there are images, symbols and short terms that can be related (Tita Pertama Wati, 2021). The application of this card can make it easier for stu-dents to remember and associate images and terms in life. The use of Flashcard media in the learning process in the classroom is also one of the educational games in the form of cards that can increase students' memory and independence (Maulidah, 2020). This learning media can also be used as a game because it will test students' memory regarding terms and pictures on certain materials. The exist-ence of Flashcard media and the CIRC model can help students' learning outcomes improve because they have a suitable combination. Student learning outcomes can also be interpreted as the result of the interaction of students and teachers in carry-ing out the learning process in the classroom (Afnan et al., 2021). In the interaction between teachers and students in the learning process to find out how the results of the day's learning are, the teacher can provide exercises to students. Because learn-ing outcomes can also be interpreted as a tool to find out the abilities of students obtained after learning in class and then in tests to complete exercises in learning (Suhery et al., 2020).

Based on the results of interviews with class V teachers, information was ob-tained about the learning style of students who tend to like to work in groups be-cause students have an interest in working with friends. In addition, students also have great enthusiasm if made in groups. In the learning process, teachers do not use teaching media because they are considered to be overwhelmed because of active students. The homeroom teacher of class V also did not use ppt media or learning videos because they were hindered by minimal facilities. This minimal facility makes it impossible for teachers to use LCD continuously. The teacher stated that he prefers to practice directly without any visualization first. Students are also children who like to learn there is media as expressed by the homeroom teacher of class V, but the media provided must be in accordance with the students. Students will be enthusiastic if there is a fun teaching medium. But the enthusiasm of students who like teaching media has not been realized because there are obstacles from teachers. As for the learning model, teachers have once applied the CIRC model but it has not been continued. Because basically this CIRC model is a model that combines read-ing and writing important things. Meanwhile, the learning outcomes of students in science and science learning can be said to be good. However, this is influenced by the curriculum where the teacher considers that students only memorize material that is repeated. Even though the material is repeated, there are still students who have not completed it, this is because students are not enthusiastic about participat-ing in learning. The teacher also revealed that in the learning process there are still many students who like to be crowded by themselves, talk to their peers and do

not pay attention to the teacher's explanation because the students are not enthusiastic because there is no interesting media and the usual learning model.

This research is not the first research but has also been researched by (Mulyono & Madiun, 2024) which obtained significant results, but this study used a class I sample while this study used a class V sample and a different learning cluster. Meanwhile, the research conducted by (Dwi Puspitasari, 2019) This obtained effec-tive results when compared to conventional learning, but the study did not use Flashcard media. Then the research conducted by (Mangundap et al., 2023) obtain-ing results can improve student learning outcomes well, but this study also does not use Flashcard teaching media. There are also similarities with this study, namely using the CIRC learning model and taking data from elementary school institutions.

After knowing the above problems, researchers are interested in conducting re-search on "The effectiveness of the circ model with the help of flashcard media on the learning outcomes of science class v". This study aims to provide information on how effective the use of the CIRC learning model assisted by Flashcard media is in learning ipas. So that teachers and students no longer feel a one-way learning pro-cess and student learning outcomes can improve.

## Method

The type of research used in this study is quantitative. According to (Sugoyono, 2020) Quantitative research can be interpreted as a research method used to research on a specific population or sample for data collection using research instruments. As for data analysis, statistics will be used that aim to test the hypothe-sis that has been established. The design used in this study is pre-experimental. The design models used in this study are One Group Pre-test and Post-test. The use of experimental research methods is because they want to find out whether there is an influence from the results of a treatment in the hope of getting accurate results be-cause they will compare before and after treatment (Purwanza et al., 2022). Re-search with an experimental design can also be interpreted to find out if there is a difference in the treatment of using the CIRC learning model assisted by Flashcard media. This research was conducted at MIM Gonilan with a sample of 29 students from the VA class. The data collection technique was carried out by using pre-test and post-test question instruments carried out by VA class students with a total of 20 multiple-choice questions and then conducting an interview with the homeroom teacher of class V to find out how the learning process was in the classroom and how the teacher's teaching activities were in the classroom. The data analysis technique is carried out by conducting several tests, namely the normality test, homogeneity test, hypothesis test with the type of paired sample t test and then the last one uses the n-gain test to find the effectiveness of the data.

## Result and Discussion

This study was conducted to find out how effective the Flashcard-assisted CIRC learning model model was applied to students. The results of this study will provide an overview of how effective the learning model and media are. This study will compare the scores of pretest and posttest students to find out whether there is an increase or decrease in learning outcomes when using the CIRC learning model assisted by Flashcard media. This calculation is carried out using an application, namely SPSS. This research went through several steps to obtain satisfactory results such as normality test, homogeneity test, paired sample t test and n-gain test. The first test is the normality test.

Normality test

Before conducting a test hypothesis test which will first be carried out a nor-mality test, this test is carried out to find out whether the research data is normally distributed or not. The data tested came from the results of the pretest and posttest scores that had been carried out by the researcher on class V students who had a sample of 29 students. Because the number of samples was only 29 people, it can be said that the sample was at < 50, the normality test that can be used by researchers is the Shapiro-Wilk normality test. The provisions in the normality test are that the data can be said to be normally distributed if the significance is > 0.05. On the other hand, if the significance value is < 0.05, the data is not distributed normally. The following are the results of the normality test of pretest and posttest data: Table 1.

**Table 1.** Tests of normality

| | **Shapiro-Wilk** | | |
|---|---|---|---|
| | Statistic | df | sig |
| **Learning outcomes** | .953 | 29 | .214 |
| | .937 | 29 | .084 |

The results of the table above can be seen that the results of the pretest data processing show a significance value of 0.214 > 0.05 and the posttest data acquisi-tion has a significance value of 0.084 > 0.05. Because each data has a significance value (Sig.) of more than 0.05, it can be concluded that the two data are normally distributed. The test that will be used next is the homogeneity test.

Homogeneity Test

Before conducting a hypothesis test, the researcher conducted a test that was carried out, namely a homogeneity test. This test was carried out by the researcher to find out if the data had the same variance. The provisions of the homogeneity test are that if the significance value > 0.05, the data is considered homogeneous. On the other hand, if the significance value < 0.05, the data is not homogeneous. Here is Table 2 of the homogeneity test.

**Table 2.** Test of homogeneity of variance

| | | Levene Statistic | df1 | df2 | sig |
|---|---|---|---|---|---|
| **Learning Outcomes** | Based on Mean | 2.394 | 1 | 56 | .127 |

The results of the data processing can be seen in the table above that the results of the homogeneity test show the significance value obtained on the basis on mean of 0.127 > 0.05. Because the significance value is more than 0.05, it can be conclud-ed that the data in this study are homogeneous or have the same variance.

Uji Paired Sample t test

Furthermore, the hypothesis test for this study is the hypothesis test used, namely using the paired sample t test. This paired sample t-test was carried out on the same sample but with two different data. There are provisions for the paired sample t-test, namely if sig. < 0.05 and the ttable value > the ttable value, H0 is re-jected and Ha is accepted. After conducting a paired sample t-test using spss, the results of the t-test analysis from this study can be seen in the following Table 3

**Tabel 3**. Paired samples test

| | | Paired Differences | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | mean | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference Lower | Upper | t | df | Sig. (2-tailed) |
| **Pair 1** | Pre test | - | 9.941 | 1.846 | -39.299 | -31.736 | -19.239 | 28 | .000 |
| | Post test | 35.517 | | | | | | | |

The results of the Paired Samples Test above show that the Sig. (2-tailed) value is 0.000 < 0.05, meaning that there is an average difference between the pretest and posttest scores. The difference between the results of the pretest and the posttest indicates that there is an influence of the use of the CIRC model with the help of Flashcard media on the learning outcomes of science science class V. Based on the table above, it is known that the calculation is 19.239, so the comparison between the calculation and the table is 19.239 > 2.048. Therefore, it can be concluded that H0 is rejected and Ha is accepted, meaning that there is a difference between the results of the pretest and the posttest, thus the impact of the use of the CIRC model with the help of Flashcard media on the learning outcomes of gastrointestinal organ material in class V humans

N-gain test

The effectiveness of the use of the CIRC model with the help of Flashcard me-dia on learning outcomes can be calculated through the N-Gain score. This calcula-tion can be accumulated using the spss application, but before that, you must know that there are categories to classify the N-Gain score, which category is included, then the following are the guidelines for Table 4 and Table 5

**Tabel 4.** N-Gain score categories

| Score N-Gain | Category |
|---|---|
| N-Gain > 0,70 | Tall |
| 0,30 ≤ N-Gain ≤ 0,70 | Keep |
| N-Gain < 0,30 | Low |

**Tabel 5.** Categories of effectiveness n-gain percent

| N-Gain Percent | Category |
|---|---|
| < 40 | Ineffective |
| 40 – 55 | Less Effective |
| 56 – 75 | Quite Effective |
| >76 | Effective |

After testing using spss with pretest and posttest value data to find out the re-sults of the N-Gain test, the results of the test are as follows: Table 6

**Tabel 6.** Test Results of N-gain score pretest and posttest score data

| Variable | N | Result | |
|---|---|---|---|
| **Pretest Values & Posttest Scores** | 29 | Score N-Gain | 0,69 |
| | | Information | Keep |
| | | Persentase N-Gain | 68,65% |
| | | Information | Quite effective |

After the calculation, the N-Gain result was obtained with a value of 0.69 or 68.65% where the value was included in the moderate or quite effective category. With these calculations, it can be concluded that the effectiveness of the use of the CIRC model with the help of Flashcard media on the learning outcomes of science science class V is moderate or quite effective.

Good learning is learning that can make students feel happy and comfortable when participating in classroom learning. Fun learning will certainly have an impact on satisfactory student learning outcomes. To find out the learning outcomes of stu-dents, teachers can do it by providing test sheets. The test can be used as a measure of how well students understand the material taught by the teacher. On this occasion, the author will discuss how effective the use of the CIRC learning model with the help of Flashcard media can have an impact on students' learning outcomes in hu-man digestive organ material.

In this study, there were significant results on the learning outcomes of stu-dents before and after treatment. This result can be seen in the highest score ob-tained during the pretest in the VA class, which was 60 and the lowest score was 35. Meanwhile, getting an increase in the results of the posttest the highest student score was at 95 and the lowest was at 70. With the naked eye, it has been seen that there has been a significant change in the acquisition of this data. The data that the re-searcher tested was also normally distributed because it was at a value of 0.214 in the pretest score and 0.084 in the posttest score. The researcher also conducted a hypothesis test where the hypothesis test that was suitable for this study was the paired sample t test the results of this test were 19.239 > 2.048 obtained from the tcount value with the ttable. In the results of the hypothesis test, it can be said that H0 is rejected and Ha is accepted, which means that there is a difference between the learning outcomes of students for the pretest and the posttest. However, in the calcu-lation of the effectiveness of this implementation, moderate or sufficient values are obtained. It can be seen from the acquisition of n-gain test scores with a result of 0.69 or 68.65%, the results can be categorized at a moderate or quite effective level. Although this study is less effective, there are also studies with effective results in applying the CIRC learning model. An effective research with a tcount value of 6,884 > 2,042 with a significance level of 5% (Khaatimah et al., 2017). In addition, there are also previous studies that obtained research results on students who partic-ipated in learning with the CIRC model had the lowest communication ability in representing a mathematical description verbally compared to other communication skills (Junior et al., 2021).

Based on the objectives that have been prepared, the research in using the CIRC learning model assisted by Flashcard media on the learning outcomes of sci-ence class V resulted in a fairly effective discussion. However, in the research con-ducted by Mangundap et al, significant results were obtained with an average of 60.83 and 90.83 where the research experienced an improvement in learning out-comes using the CIRC learning model (Mangundap et al., 2023). This learning mod-el will make students asked to read reading materials and then write down what stu-dents consider important and then to find out how the learning outcomes of teacher students can take tests. The application of the appropriate learning model will have an impact on the learning outcomes of students and how they think. The application of the CIRC learning model is not only used for student learning outcomes but can also be used for reading comprehension. This research has been conducted with the results of the average class achievement of 62.5% and 95.8% not only in reading comprehension but also in the activity of students in the classroom by 33% (Pujabakti et al., 2021).

The use of teaching media also has an impact on student learning outcomes be-cause through teaching media students will understand better because they are helped to visualize. The use of this media can also make students learn in real life and provide a clear experience and make abstract concepts real with teaching media can also improve students' learning ability (Budianti et al., 2023). The teaching me-dium used in this study is Flashcard which has pictures, brief meanings and attrac-tive colors. The flashcard that the researcher uses behind the card is the function of the digestive organs. Flashcard media is a small card in which there are components of images, text or symbols that can help students improve their memory on some-thing related to images (Sakdah & Anas, 2023). In addition, previous research ob-tained results regarding his research in Flashcard media, the researcher revealed that this media is able to improve students remembering various vocabulary (Hidayat, 2022). In addition, this Flashcard media also makes learning in the classroom fun and not monotonous because there is a teaching media that is fun and makes students more active. The results of previous research revealed that Flashcard media is effec-tive in using because it is very helpful for students in learning and makes it easy for students to remember (Rodiyana et al., 2022).

The application of the CIRC learning model with the help of Flashcard media in the VA class has high enthusiasm. During the implementation, the VA class stu-dents followed well even though the class became unconducive because the class had 29 students and the students were classified as active. During the implementation, students dare to express their opinions and ask questions. According to the confes-sion from the homeroom teacher, students do like it if there is a new teaching media because teachers rarely use teaching media. The enthusiasm of these students makes learning in the classroom not monotonous and not one-way. Students do have a basic love of reading, so the application of the CIRC model is considered appropriate. Researchers chose learning about human digestive organs because students need visualization of their digestive organs. By using this Flashcard media, students feel helped because they know the image, organ name, brief meaning and function of the organ on one card. This learning is included in the science cluster where this learn-ing will make students more careful in consuming food and maintaining their organs so that they remain healthy. Science learning in elementary schools is indeed neces-sary to introduce students to be sensitive to the surrounding environment (Toaini, 2023). The research conducted by Kulsum et al. by utilizing video discussions also had satisfactory results compared to the use of poster media (Kulsum et al., 2023). With that, the use of learning media can play a role in student learning outcomes.

## Conclusion

This study will provide a conclusion about the effectiveness of the CIRC model with the help of Flashcard media on learning outcomes in the VA class, showing that it has an effective level in the medium category. The implementation of the CIRC model with the help of Flashcard media can make students' learning outcomes better. These results can be seen in the obtained paired sample t test score with a ttable which obtained a value of 19.239 > 2.048 which means that H0 is rejected and Ha is accepted, this also means that there is a difference between the results of the pretest and postest. And in the results of the n-gain test, a score of 68.65% this can be included in the medium or quite effective category. And the response of students when given the treatment of learning using this method and media is active and not monotonous. So learning in the classroom feels like a two-way way and teachers no longer only transfer knowledge but also provide direct experience to students. Suggestions for future research are better to use a larger and more diverse sample of students. With a diverse and wide range of students, it can make an evaluation of the application of learning models and media in the long term.

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