Vol. 12, No. 3, pp. 1034-1046, 2022 DOI: 10.23960/jpp.v12.i3.202204

Jurnal Pendidikan Progresif

e-ISSN: 2550-1313 | p-ISSN: 2087-9849

http://jurnal.fkip.unila.ac.id/index.php/jpp/

The Effect of Multimedia-Based CIRC Learning Model on Thematic Learning Outcomes

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Received: 29 March 2022 *Accepted: 13 June 2022* *Published: 02 July 2022*

Abstract: The Effect of Multimedia-Based CIRC Learning Model on Thematic Learning Outcomes. Objectives: The low students' learning outcomes encourage this study to analyze and determine the effect of the implementation of the multimedia-based Cooperative Integrated Reading and Composition (CIRC) learning model on the students' thematic learning outcomes. **Methods:** Quasi-experimental and quantitative approaches were employed in this study with a non-equivalent control group design. The purposive sampling technique was used in determining the research sample from a total population of 59 students. The data were collected through test and non-test techniques. **Findings:** Based on the hypothesis test using a simple regression formula, the data obtained that $F_{count} > F_{table}$, i.e., 9.19 > 4.20, which has a positive and significant effect on students' learning outcomes after the implementation of the CIRC model combined with multimedia. **Conclusion:** The CIRC learning model applied is concluded as an effective learning model as it could improve students' learning outcomes.

Keywords: CIRC, multimedia, learning outcome.

Abstrak: Dampak Model Pembelajaran CIRC Berbasis Multimedia terhadap Hasil Belajar Tematik. ***Tujuan:*** *Rendahnya hasil belajar siswa mendorong penelitian ini untuk menganalisis dan mengetahui pengaruh penerapan model pembelajaran CIRC berbasis multimedia terhadap hasil belajar tematik peserta didik.* ***Metode:*** *Eksperimen kuasi dan pendekatan kuantitatif diterapkan dalam penelitian ini dengan non-equivalent control group design. Teknik purposive sampling digunakan dalam menentukan sample penelitian dari jumlah populasi sebanyak 59 peserta didik. Data dikumpulkan melalui teknik tes dan non-tes.* ***Temuan:*** *Berdasarkan tes hipotesis menggunakan rumus regresi sederhana, didapatkan data bahwa* $F_{hitung} > F_{tabel}$ *yaitu 9,19 > 4,20, yang mana terdapat pengaruh yang positif dan signifikan terhadap hasil belajar siswa setelah penerapan model CIRC yang dikombinasi dengan multimedia.* ***Kesimpulan:*** *Model pembelajaran CIRC yang diterapkan disimpulkan sebagai model pembelajaran yang efektif karena dapat meningkatkan hasil belajar siswa.*

Kata kunci: *CIRC, multimedia, hasil belajar.*

To cite this article:

Khairani, F., Ambarita, A., Diana, S, M., & Elsiyana, E. (2022). The Effect of Multimedia-Based CIRC learning model on Thematic Learning Outcomes. *Jurnal Pendidikan Progresif*, *12*(3), 1034-1046. doi: 10.23960/jpp.v12.i3.202204.

INTRODUCTION

Education is an attempt to actualize a circumstance as well as the learning process for learners to construct their potential maximally, namely improving ways of thinking so that they could configurate proper education, high social attitudes for national life, and possess the skills needed. This statement is confirmed by the Indonesian Statute (Departemen Pendidikan Nasional, 2003) which states that educators are responsible or charged in realizing a humanizing learning process, that is helping students develop their diverse potential optimally. Self-potential is developed with the help of educators, family, as well as environment. The educational process is carried out in stages and requires assistance to attain educational goals. One of them is that education could run well as the curriculum is the main foundation in learning.

The curriculum is the basis of learning that helps achieve learning objectives with crucial programs. Indonesia applies the 2013 Curriculum in learning. The 2013 Curriculum focuses on student-centered learning. According to (Prasetyawati, 2016), the implementation of the 2013 Curriculum is very demanding on learner-centered. The paradigm shift in the learning process from teacher-centered to student-centered is expected to activate students to be involved in constructing knowledge, attitudes, and skills. The curriculum determines the learning outcomes that students have to achieve.

The learning outcomes are influenced by several existing factors. Several factors that affect learning outcomes are explained by (Pingge & Wangid, 2016), i.e., the ability of educators to diagnose learning difficulties which means an affair or action that requires a process in determining students' problems in learning by identifying the background causes. The causes of learning difficulties are in the students themselves and their external (Rusman, 2016; Susanto, 2016; Thobroni, 2015). Learning difficulties from within students include intellectual ability, motivation, age, gender, study habits, and memory aptitude. The external factors of learning difficulties are from educators, learning quality, learning instruments or facilities in the form of hardware and software, likewise the environment, both the social environment and the natural environment. Hardware in a learning system is such as buildings, facilities, and infrastructure. Meanwhile, software means curriculum, media, and learning models used. Educators must adjust appropriate learning models and media so that learning outcomes could be achieved.

The findings of observations of class IV-A and IV-B students at SD Negeri 5 Metro Pusat in October 2019 disclosed that the learning model had not been varied optimally, it was seen from the cooperative learning model which had not been integrated into the CIRC model; also, the process of learning in class IV-A did not form groups and did tasks individually; whereas, class IV-B formed groups, yet did tasks individually; moreover, educators still dominated the learning process. As a result, students were less interested in participating in the learning process, some students still interacted with each other when the teacher was delivering the material, also when the teacher gave tasks, the atmosphere was not conducive.

Besides, at the time when researchers conducted interviews with teachers, it was found out that the teachers had not used multimedia optimally, this was conveyed by the teacher of class IV-A that the use of multimedia was rarely done, and the teacher of IV-B stated that the frequent use of media, namely pictures, students' printed books, and whiteboard. Moreover, the use of LCD has not been used optimally, the teacher of class IV-A uses LCD only on certain materials, while the teacher of class IV-B does not understand how to operate LCD. It causes

the students' learning outcomes that are classified as low, as evidenced by the findings of the documentation which shows that more students in class IV-A have not reached the Minimum Completeness Criteria (KKM), which is 77% compared to class IV-B, which is 59%. The KKM is the minimum score limit that must be accomplished by students in each subject, either partially (subject) or entirely in the semester (Musiyati, 2019), with the provisions that have been determined by the school at the beginning. The specified KKM at SD Negeri 5 Metro Pusat is 75.

Based on the findings of observations, interviews, and documentation that have been describe, it could be seen that several problems that occur in class IV, SD Negeri 5 Metro Pusat include (1) teachers still dominate when learning takes place, (2) variations in learning models have not been implemented optimally, seen the cooperative learning model used has not been varied into a CIRC learning model, also the learning process in class IV-A that does not form groups and the students do tasks individually, yet students of class IV-B form groups, but still accomplish the tasks individually, (3) students are less fascinated in participating in the learning process, it could be seen that there are still some students who interact with each other when the teacher is delivering the material and the atmosphere is not conducive when the teacher is giving the task, (4) the teachers have not employed multimedia optimally, it was conveyed by the teacher in class IV-A that the use of multimedia is rarely done; and in class IV-B, the frequent use of media are pictures, students' printed books, and blackboards, (5) the use of LCD has not been used optimally, the teacher in class IV-A use LCD only on certain materials, while the teacher in class IV-B does not understand how to operate LCD, (6) the students have low thematic learning outcomes, more students in class IV-A who have not attained the KKM at 75 compared to class IV-B.

A solution to improve the learning outcomes of fourth-grade students in Thematic at SD Negeri 5 Metro Pusat regarding the problems that occurred during the observation, interview, and documentation, i.e., implementing the multimedia-based learning model. The model applied in learning must enact students responsible for their tasks, make them independent, able to establish good cooperation between groups, and exchange notions so that the process of learning and the classroom atmosphere become favorable.

The learning model chosen by the researchers to overcome the problems found in the subject of this study is the CIRC model. This model was chosen by reason of it could help students understand the lesson material better, be active by interacting with other students, and create a meaningful learning process. The CIRC learning model combines reading and writing skills in the learning process. Thereto, the finding of research by (Mahardika, Agung, & Rendra, 2017) as the supporting data shows that the CIRC model could improve students' learning outcomes. According to (Slavin, 2015), as a learning model, CIRC brings a comprehensive layout to teach reading, writing, and arts of language in higher grades in elementary schools that emphasizes group goals and individual responsibility.

The multimedia was chosen since it could attract students' attention and make them interested, so that they could participate actively and create a pleasant atmosphere in the classroom. It is in accordance with the findings by (Andinny & Lestari, 2016; Khairani, Senen, & Kamil, 2020) which shows that multimedia could have a significant influence on learning outcomes. According to (Khairani, Ningtias, & Destini, 2021; Surjono, 2017), a composite of several media, e.g., images, text, sound, video,

etc. that are used to convey messages or information refers to multimedia. In this study, the multimedia used is text, sound, and animation. Regarding the description of the background of the problem, the researchers are aware that further research is needed, so this research was carried out with the title "The Effect of the Multimedia-based CIRC Learning Model on Students' Learning Outcomes in the Theme of *Cita-Citaku* for Grade IV".

METHODS

This research is a quasi-experimental study with non-equivalent control group design, in which there are two groups, namely the experimental group and the control group. The quasi-experimental design allows to see the difference in the pre-test and the post-test between the experimental group and the control group.

This study was carried out at SD Negeri 5 Metro Pusat for the 2019/2020 academic year with class IV A as the experimental group and class IV B as the control group. The experimental group is the group that is treated with the CIRC model with multimedia, while the control group is the group that does not receive treatment like the experimental group but uses the usual treatment done by teachers, that is using the snowball throwing model. The population in this study were all fourth-grade students of SD Negeri 5 Metro Pusat in the 2019/2020 academic year, totaling 59 students. Sampling was done by purposive sampling technique (Arikunto, 2014) and determined class IV-A consisting of 30 students as the experimental group, while class IV-B consisting of 29 students as the control group.

The research design was adapted from research (Sugiyono, 2021) which can be seen in the following figure.

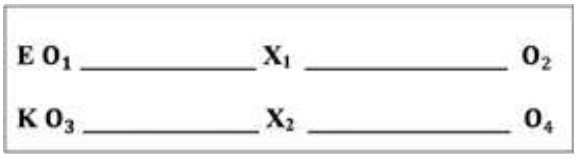

Figure 1. Research design

Note:
E : experimental group, class IV A
K : control group, class IV B
O_1 : pre-test experimental group
O_3 : pre-test control group
X_1 : CIRC model treatment in the experimental group
X_2 : snowball throwing model in the control group
O_2 : post-test experimental group
O_4 : post-test control group

The pre-test was carried out with treatment in both the experimental group (O_1) and the control group (O_3). The post-test was given in the last meeting for both the experimental group (O_2) and the control group (O_4). The pre-test and post-test scores were used as a comparison between the experimental group and the control group.

The procedure in this study consisted of 3 stages, they are: the preparation stage, the implementation stage, and the final stage of the research. At the preparation stage, there are steps taken, including 1) carrying out preliminary research in the form of observation, interviews, and documentation as initial data collection techniques; 2) formulating problems from the results of preliminary research; 3) selecting two groups of subjects to be the experimental group and the control group; 4) determining core competencies, basic competencies, and discussion themes to be used in the research; 5) Making learning tools in the form of mapping, syllabus, lesson plans, and students worksheets;

6) creating a highlight of research instruments; 7) developing research instruments in the form of multiple choice questions; 8) conducting a try-out test of the instrument in the IV C class with a total of 29 students as respondents at SD Negeri 5 Metro Pusat; 9) analyzing the test items by testing the validity and reliability of the instrument.

Moreover, the steps in the implementation phase of the research include 1) giving a pretest to the experimental group and the control group; 2) conducting treatment in the experimental group by applying the CIRC model with multimedia and the snowball throwing learning model in the control group; and 3) giving a post-test to the experimental group and the control group as well to find out the differences in the learning outcomes of the experimental group and the control group. Besides, the steps in the final stage are: 1) analyzing and processing the data in the experimental group and control group by using statistical calculations to determine the effect of the implementation of multimedia-assisted CIRC model on students' learning outcomes, 2) drawing a conclusion to answer the research questions, then 3) compiling research reports.

The test and non-test techniques were applied for collecting the research data. The non-test technique in this study uses structured observation with the type of participant observation. According to (Sugiyono, 2021), structured observation is an observation that has been systematically designed, about what will be observed, when, and where it is. Observations in this study were carried out once per meeting when the researchers conducted the learning process, so the total implementation of observations was 6 times. The non-test instrument used was an observation sheet with 10 aspects of observation adapted from a research by (Simanjuntak, Simbolon, Murni, & Harun, 2019). Observation sheets are used as an auxiliary method in research to observe how the implementation of the CIRC model with multimedia in learning is implemented, as well as observing the activities of educators and students using the CIRC learning model.

The test technique is used to measure the learning outcomes of students' cognitive domains. The tests that were distributed were in the form of pre-test and post-test which were carried out before and after the treatments. The test in this study is an objective test in the form of multiple-choice questions with 4 options of 40 items, and after being tested for validity as many as 20 items are used. The test items are under the topic of Theme 8 (*Daerah Tempat Tinggalku*; The Area Where I Live); sub-theme 2 (*Keunikan Daerah Tempat Tinggalku*; The Uniqueness of The Area Where I Live). Each correct answer is given a score of 1 and an incorrect answer is given a score of 0 with a maximum score of 100.

In this study, the instrument prerequisite test used the product moment validity test proposed by Pearson (Arikunto, 2014). The criteria are, if $r_{count} > r_{table}$ with á = 0.05 then the instrument is declared valid, meanwhile if the $r_{count} < r_{table}$, then the instrument is not valid. After testing the validity of the instrument, the next step is to measure the level of instrument reliability. The reliability test of the instrument was done by adapting (Arikunto, 2014) with the KR.20 formula (Kuder Richardson). The data was processed using Microsoft Office Excel program with test criteria, namely if $r_{count} > r_{table}$ with á = 0.05 then the instrument is said to be reliable, whilst the $r_{count} < r_{table}$, then the instrument is not reliable (Arikunto, 2014).

Furthermore, hypothesis testing in this study employs quantitative approach to determine the effect of the CIRC model on students' learning outcomes on the Theme of *Cita-Citaku*. The data were analyzed using simple linear regression with a significance level of 5% or á = 0.05. A prerequisite test was run in the form of a normality

test using the *Chi-square* formula and a homogeneity test using the F-test (Aqib, 2010; Muncarno, 2017). The interpretation of the test results is if $F_{count} > F_{table}$ then H_a is accepted, while if the Fcount<Ftable then H_a is rejected. Therefore, it indicates that there is a positive and significant influence on the application of the multimedia-based CIRC model on students' learning outcomes if the H_a is accepted. Meanwhile, the non-test data were analyzed descriptively. The gathered data of teacher's activities were then categorized into five categories, namely Very Poor, Poor, Fair, Good, and Very Good (Arikunto, 2014).

RESULTS AND DISCUSSION

The results of the study were based on the results of the pre-test and post-test that had been carried out in the experimental group and the control group. The researchers calculate and analyze the difference in students' learning outcomes using the N-Gain formula after finding out the mean of students' scores both at the pre-test and the post-test. The calculation of the N-Gain is classified into three parts, namely high, medium, and low. Table 1 below reveals the results of N-Gain testing and its classification for the experimental group and control group.

Table 1. The N-Gain results of experimental and control groups

No.	Group	Mean Score		<g>	Category
		Pre-test	*Post-test*		
1	Control	54.31	69.31	0.29	Low
2	Experimental	49.33	76.33	0.5	Medium

According to the results of the N-Gain test calculation, Table 1 shows that there is an improvement in students' cognitive abilities in both classes—experimental class and control class, in which the N-Gain value for the control class is 0.29 which belongs to the low category, while in the experimental class, it is obtained the N-Gain value of 0.5 which belongs to medium category. This shows that the learning outcomes of the control group students experienced a higher increase when compared to the control group. According to (Sejati, Amaluddin, Hidayati, Kasmiati, & Sumarmi, 2017) that there are factors that influence the learning success of students. These factors include how to organize materials, methods, and media. This is also confirmed by (Blanton, Sindelar, & Correa, 2006) which states that the quality of learning is always related to teaching methods, teacher behavior, student involvement, learning media, learning materials, and learning systems. Another factor that contributes to the success of learning is learning interaction. Teaching and learning interactions must pay attention to the tools, facilities, and media that will be used that can improve learning objectives. The use of different models in learning makes interactions different (Acher, Arca, & Sanmarti, 2007).

In this study, the experimental group was given treatment using the multimedia-assisted CIRC model. The CIRC model affects the activities and learning outcomes of students. In the implementation of the CIRC model, the delivery of learning materials by educators is assisted by using multimedia so that the learning process is more innovative and able to activate students in learning. By using the CIRC model, the interaction between teachers and students becomes more optimal. This is in accordance with (Jung, Choi, Lim, & Leem, 2002; Sessoms,

2008) that teachers who are able to create a pleasant classroom atmosphere by facilitating student learning such as providing media and using learning methods can develop the potential of students to be greater and learning outcomes will improve. The hypothesis testing was then carried out using quantitative data analysis techniques to determine the effect of the multimedia-based CIRC model on students' learning outcomes. The data were analyzed using simple linear regression with a significance level of 5% or á = 0.05. Before testing the hypothesis, a prerequisite test was carried out in the form of a normality test using the chi-square formula and a homogeneity test using the F-test (Aqib, 2010; Muncarno, 2017).

The normality test is to ensure that the sample of the population is distributed normally, whilst the homogeneity test is to discover that the data comes from the same variance. The normality test used the *Chi-Square* formula in Microsoft Office Excel 2010. The results of the normality test in the pre-test of the experimental group and the control group with a significance level of 5% or á = 0.05, namely 4.848 and 5.091 which prove that the pre-tests were normally distributed. Meanwhile, the results of the normality test in the post-test of the experimental group and the control group with the significance level of 5% or á = 0.05, namely 4.704 and 5.455 indicate that the post-tests were normally distributed. Furthermore, the homogeneity test utilized the F-test formula with the significance level of 5% in Microsoft Office Excel 2010. The results of the calculation are $F_{count} < F_{table} = 1 < 1.88$ in the pre-test, similarly to the post-test that $F_{count} < F_{table} = 1.07 < 1.88$. Based on the F value, it is concluded that the population has a homogeneous variance so that it can be continued with hypothesis testing.

Hypothesis testing was carried out to determine whether or not there is an effect between the use of multimedia-based CIRC learning model on students' learning outcomes in Thematic lessons. The hypothesis was tested using a simple regression test with a significant level of 5% or á = 0.05. The results of the testing could be seen in the following table.

Table 2. The hypothesis testing results of experimental and control classes

No.	Characteristics	Nilai		Finding
		Experimental Class	Control Class	
1	F_{count}	9.19		H_0 is
2	F_{table}	4.20		rejected

Based on Table 2, after calculating the F-test, it reveals that the F_{count} is higher than F_{table}, in which 9.19>4.20, it means that the H_0 is rejected and the H_a is accepted; therefore, it is summed up that there is a positive and significant effect on the implementation of the CIRC learning model on students' learning outcomes on the Theme of *Cita-Citaku* for grade IV in SD Negeri 5 Metro Pusat.

The CIRC Learning Model is one of the cooperative learning models which was originally an integrated cooperative teaching of reading and writing skills (Utami, Darsana, & Suadnyana, 2014). Regarding cooperative learning, it refers to various teaching-learning methods that help pupils to work together in small groups to learn lesson materials and take responsibility for the taken tasks (Hasriyanti & Ramadhani, 2019). In the learning process, CIRC emphasizes students to work together, support each other, discuss and argue about their ideas to improve their understanding and knowledge in order to do the

tasks given effectively and efficiently (Çolak, 2015; Gull & Shehzad, 2015; Morgan, 2019; Stevens, 2008). In other words, cooperative learning will help students build effective communication skills, improve their literacy skills, language skills, as well as social skills, also metacognitive abilities to think (Bromley & Modlo, 1997).

Moreover, the CIRC learning model invites students to work together, participate actively in group discussions and enrich the interaction process between students so that it could increase students' activity. In the implementation of the CIRC model, every student has a responsibility to complete the given tasks by reading and looking for answers individually, then discussing the information obtained from reading activities. Learning through the CIRC model could provide a positive impact on students' learning outcomes, making students comfortable in learning, motivated, and more active in communicating (Sachs, G., Candlin, C., & Rose, 2003; Shaaban, 2007). As asserted by (Slavin, 2015) which states that CIRC is an exhaustive contrivance to teach reading, writing, and arts of language in higher grades in elementary school that emphasizes group purposes and individual responsibility.

In accordance, the skills that must be mastered by students formerly in the field of education are writing and reading skills (Desi, 2014). If students master these two skills, there will be an initial ability to master other skills, yet it will have an impact on students' learning outcomes at school. If students have a great interest in reading, they will be able to understand all types of texts for any purpose, including learning (O'Flynn, 2016). It means that cooperative learning such as CIRC can improve student learning outcomes (Adesoji & Ibraheem, 2009; Durukan, 2011). This is in accordance with (Siegel, 2005) which states that teachers are the determining factor in implementing the learning process in the classroom using the CIRC model. Teachers are required to guide students in the problem-solving process according to the material being studied.

Furthermore, (Pingge & Wangid, 2016) explain the influencing factors to learning outcomes are the ability of educators to diagnose learning difficulties which means an effort or activity that requires a process in determining students' problems in learning by identifying the background problems. Thus, the teacher becomes the determining factor in the implementation of the cooperative learning process in the classroom. As for the background causes of the poor students' learning outcomes in this study, namely the variation of the cooperative learning model and the use of LCD had not been implemented or used optimally. Therefore, in this study, a multimedia-based CIRC model was implemented.

Based on the data of this current study, the group that applies the multimedia-based CIRC learning model, experimental class, shows a higher percentage of the students' learning outcomes than the control class that uses the conventional learning model. The multimedia-based CIRC model has advantages such as facilitating students to comprehend the lessons or learning material since they could obtain new knowledge easily when they read and discuss information with their peers, there is not much noise in the learning process because students are active in reading, writing, and discussing; in addition, students could actively respond and express their ideas, also it could attract students' attention and make the learning atmosphere positive and fun since the multimedia used contains text, animation, and audio. Multimedia is used as a tool to assist teachers in conveying lesson material so that the learning objectives can be achieved and are able to facilitate students to learn by building their

knowledge (Adekola, 2010; Manjale & Abel, 2017; Wamalwa & Wamalwa, 2014).

Integrating the CIRC model with multimedia is to present lesson material by providing information related to the material to be taught to the students so that it would be well-becoming. Furthermore, (Arifin, Ricky, & Yesmaya, 2015; Cheng, 2009) state that multimedia is a composite of images, text, animation, audio, video, and other means to distribute messages or information in varieties by means of digital tools.

In line with the statement above, (Surjono, 2017) states that multimedia is a consolidation of diverse media, e.g., images, text, audio, video, and others in an integrated and synergistic manner through computers or other electronic tools to achieve certain goals. According to (Munir, 2012), multimedia is an assimilation of various media (file formats) in the form of text, images (vector or bitmap), graphics, sound, animation, video, interaction, and others that have been packaged into digital (computerized) files which are used to convey or deliver messages to the public.

Build upon the explanation above, it could be summed up that the utilization of the multimedia-based CIRC learning model could significantly affect students' learning outcomes. It supports the previous researches findings by (Muttaqin, 2017; Sastika, H, & Ashadi, 2013; Simanjuntak et al., 2019; Sutarno, Nurdin, & Awalani, 2010) which reveal that there is an improvement of the learning outcomes in the students' cognitive domain after the students were taught using CIRC based on learning media (multimedia, computer, macromedia flash, etc.) as a cooperative learning model. The improvement of the students' learning outcomes after the students were given the treatments at each learning session indicates that the CIRC learning model is effective.

CONCLUSIONS

According to the results and discussion in this study, it could be concluded that the implementation of the multimedia-based CIRC learning model is effective in improving students' learning outcomes. The effect could be seen clearly from the mean score of post-test of the experimental class at 76.39 which is higher than the mean score of the control class post-test at 69.31. The significant effect is indicated by the N-Gain value of the experimental class that is higher than the control class, in which 0.5 for the experimental class and 0.29 for the control class, with a difference of 0.21. The hypothesis testing reveals that $F_{count} > F_{table}$. It is evidenced from the test results using a simple regression formula with F_{count} of 9.19 while F_{table} of 4.20 which means the null hypothesis (H_0) is rejected and the alternative hypothesis (H_a) is accepted. The acceptance of H_a specified that there is a significant effect on the implementation of the multimedia-based CIRC learning model on the fourth-grade students' learning outcomes at SD Negeri 5 Metro Pusat.

This study shows the significant effect of the CIRC model with multimedia to improve students' learning outcomes. However, this study has limitations, namely the material used in this study is theme 8 sub-theme 2, so that the results might be different when using another theme; in addition, the population of this study was only in grade IV of SD Negeri 5 Metro Pusat, so the results also would be different if applied to other elementary schools. It is hoped that this limitation will not reduce the significant value for the development of the ability of educators which can later improve students' higher order thinking skills. Based on the results of research using CIRC with multimedia, there are several suggestions that can be given to related parties in this research, including the CIRC model with multimedia can be used as an alternative for educators in

choosing learning models that are in accordance with the material and needs of students so that students are more excited and the learning process is more optimal; accordingly, students' learning outcomes would increase. The school, especially the principal, should support and facilitate the application of various learning models, particularly the CIRC model, so as to produce good outputs and improve school quality. Finally, suggestions to other researchers who want to use the CIRC model, before using it, it is better to analyze how it is applied and the things that support the learning process, such as learning media, teaching materials, etc. Furthermore, the material must be prepared as well as possible in order to obtain better results and the limitations in this study can be minimized for further research.

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