

## Mathematical Representation Ability in terms of Student Self Efficacy Using Canva-assisted CORE Model

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### Abstract

This research aims to describe mathematical representation abilities of Class VIII students in the implementation of the CORE learning model assisted by Canva which are reviewed from self-efficacy. The research subjects were students in class VIII C and VIII B of SMP Hasanuddin 5 Semarang. The data source in this research is students, obtained from tests result on students' mathematical representation abilities, self-efficacy dimension questionnaires, and interview. The research results show that there is a positive influence on self-efficacy on mathematical representation abilities, participants' mathematical representation abilities Students in terms of self-efficacy vary, in low, medium, and high categories. Subject with low self-efficacy were 5 (25%), subjects with moderate self-efficacy are 10 (50%), and subjects with self efficacy are 5 (25%).

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## INTRODUCTION

Improving education is needed to increase human resources quality for Indonesia society's life. Through education, people can work together effectively in critical, systematic, logical, and creative thinking, and can use information from all direction (Arnidha, 2016). Many opinions stated that a nation development depends on its quality education, because qualified education produces excellence human resources (HR). One of the sciences that can support the quality of human resources is mathematics. One sign of a deep understanding of mathematics is the relationship between different mathematical ideas (Jailani et al., 2020). The ability to express mathematical ideas when learning mathematics is something that must be done by anyone who learns it. Through representation, it is easier and easier for someone to see problems that look difficult and difficult at first, making it easier to solve the problems presented.

The application of appropriate mathematical methods will also help students develop their representations, such as understanding concepts in conveying students' mathematical opinions/ideas presented with pictures, equations, symbols, or words. So that representation is a component that needs to be considered in learning mathematics (Annajmi & Afri, 2019). Sulistyowaty et al. (2019, p. 155) explained the problem of students in learning is accustomed to imitating and receiving information from the teacher by memorizing it. This is because the learning that occurs in the classroom still makes students as objects, so that students are not involved thoroughly, so that the teacher becomes the center of learning, resulting in students not developing and not being independent in their thinking process.

Self efficacy can motivate a person in regulating their beliefs so that their role is important for someone who believes in their abilities so that they have high motivation and strive for success. Bandura argues that self efficacy is the main contribution that will influence a person in making a decision and affect the actions he will take (Rasmin et al., 2018). Therefore, self efficacy must be owned by students where it will foster confidence, thereby increasing the ability to solve difficult material,

assignments, or test questions, so that they will be able to solve them well.

The mathematics teacher of class VIII SMP Hasanuddin 5 Semarang said that students still have difficulty in solving problems, besides that to bring up mathematical ideas from the problems given is not easy. Conveying to students how to develop ideas and experiences of students in the learning process individually in solving problems and their solutions is not an easy thing for students to do. In fact, not a few students who are able to solve problems according to the method conveyed by the teacher in solving the problems they face.

Fonna & Mursalin (2018) explain the importance of representation skills to improve learning achievement cannot be separated from the beliefs that exist in students in solving problems. Hassan et al. (2015) state that self-efficacy has an influence on the ability of students to deal with various situations, besides that self-belief can play a role in the success of students to achieve their life goals, as well as improve achievement. This is in line with the opinion of Li et al. (2020) self-efficacy will determine the type of attitude that a student can bring to start a learning task. The stronger the self-efficacy, the more likely it is that student will devote time and effort to achieve learning tasks, regardless of the difficulty or number of obstacles that students will face.

Use model Which appropriate in learning Also will make learning increases and learning objectives are achieved. According to Wijayanti (in Deswita et al., 2018, p. 36) CORE is model Which have base constructivism. Therefore, CORE is model learning Which applied to make the students become enthusiastic in developing their thinking in knowledge. This is in line with opinion from Saregar et al. (2021, p. 40) by applying the CORE model in the learning process, Students can develop fluent thinking, flexibility, originality, and thoughtfulness. Using the CORE model make students active during the learning process. Studentwill discuss in a way active with the group, so that can express each other's opinions so that they can form and organize solutions in the problems given by the teacher to them (Artasari et al., 2013). Model CORE also provides students with the opportunity to exchange ideas on the material learning, so that make studentNo Afraid For

put forward his opinion. When students work together, they can help each other in solving problem which exists if done alone.

The use of media can enhance a teacher's creativity in preparing materials and facilitate the delivery of learning content. Media also makes it easier for students to understand the material or message, whether in the form of text or video. Moreover, instructional media can help students become more interested and motivated by the lessons presented through such media (Rahmawati & Atmojo, 2021). Canva is an online design program that offers a wide variety of designs, including those for social media, video, office, presentations, photo collages, marketing prints, book covers, calendars, posters, worksheets, magazine covers, reports, comics, proposals, agendas, ebook covers, and many other designs (Tanjung & Faiza, 2019). The use of the Canva platform in combination with the CORE model of instruction will encourage students to believe that they have the same abilities as their peers and foster an interest in learning. This has a positive impact on students and enhances their self-efficacy in mathematics learning. The use of the CORE model with Canva support can help students develop self-efficacy, ultimately benefiting their mathematical representation ability.

Based on the description of the existing problems, the purpose of this study is to describe the mathematical representation ability of students on the implementation of the CORE learning model assisted by Canva in terms of self-efficacy.

## **METHOD**

This research is implementing a mixed method research, concurrent embedded type (unbalanced mixture). Combination research method embedded model is a research method that combines the use of quantitative and qualitative research methods simultaneously or together but the load of the method is different (Sugiyono, 2015, p. 412). Quantitative as well as qualitative data collection, followed by data analysis and interpretation. The research design refers to the concurrent embedded mixed method research design by (Sugiyono, 2015, p. 541) which is adjusted as needed.

This research emphasizes on qualitative research methods as the primary method, and quantitative methods as the secondary method. Quantitative research in the study, as supporting data to analyze the ability of mathematical representation in terms of three categories of self-efficacy and from three categories. The research was conducted at Hasanuddin 5 Semarang Junior High School, the population in this study were all students in grade VIII. The research sample was two of the three classes in class VIII. One class was selected as an experimental class with a total of 20 students and the other as a control class with a total of 20 students. In the experimental class, categorization was carried out in terms of students' self-efficacy (high, medium, low self-efficacy). Each category on self-efficacy is then taken two students to be used as research subjects.

The research design used in quantitative research is a quasi-experiment design designed in the form of a non-equivalent (pre-test and post-test) control-group design, where the selection of the two groups is not randomly selected. As for qualitative research, the approach used is grounded theory so that it allows researchers to dig deeper into the problem under study. Deeper exploration was carried out on experimental class research subjects.

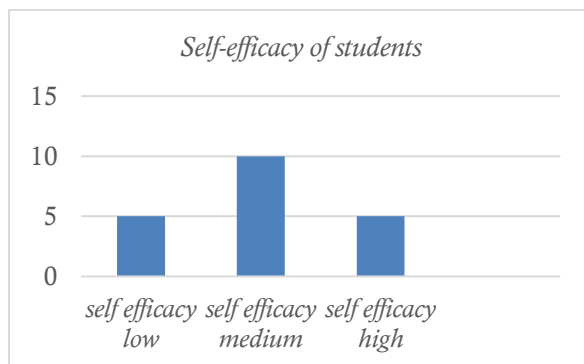
Quantitative data analysis is divided into 2, namely initial and final data analysis. The initial data analysis (derived from the initial mathematical representation skills to determine the similarity of the mean scores between the experimental and control groups) involved tests for normality, homogeneity, and equality of two means. Meanwhile, the final data analysis (conducted after instruction through the CORE model with Canva support) included tests for proficiency, mean difference, proportion difference, and improvement.

Qualitative data analysis follows the concept of Miles & Huberman (2009) where activities in qualitative data analysis are carried out interactively and continuously at each stage of research until completion, and the data is analyzed thoroughly. This analysis technique involves three main steps, namely data reduction, data presentation, and conclusion drawing.

## **RESULTS AND DISCUSSIONS**

This study identifies the representation ability of research subjects in solving a problem which includes five indicators of mathematical representation from three categories (visual representation, symbolic representation, and verbal representation), namely (a) Making a picture of existing data from the representation using words to facilitate solving a problem, (b) Generating mathematical ideas from the representation that has been given, (c) Solving problems involving mathematical ideas, (d) Arranging the solution of a problem from the representation using words, and (e) Answering existing questions using words or written text.

(e) Answering existing questions using words or written text. Grouping students based on self-efficacy questionnaires was carried out before the implementation of learning. Self efficacy is divided into three categories, namely high self efficacy (ST), moderate self efficacy (SS), and low self efficacy (SR). Based on the results of the analysis on the self efficacy questionnaire, the grouping data as shown in Figure 1 was obtained.



**Figure 1.** Diagram of Grouping students based on Self Efficacy

Based on Figure 1, in this study, research subjects from each category were selected as many as two students. The purpose of this selection is to analyze their mathematical representation skills in depth.

This study examines the effectiveness of the implementation of the CORE learning model assisted by Canva on students' mathematical representation skills, obtaining the results (1) at the learning planning stage, the average total score of the learning device assessment results is 4.42 (including the very

good category). (2) at the learning implementation stage, the total average assessment of teacher activities is 4.38 (including the excellent category). (3) at the learning implementation assessment stage, the significant value of the normality test is  $0.200 > 0.05$  so it can be concluded that the mathematical representation ability test data comes from a normally distributed population; the significant value of the homogeneity test is  $0.817 > 0.05$  so it can be concluded that the mathematical representation ability test data comes from a homogeneous population; obtained the z count value is 2.63493 while the z table is 1.64 so that  $z \text{ count} > z \text{ table}$ , it can be stated that the proportion of students with the CORE learning model assisted by Canva who have reached mastery is more than 75% of students who get a mathematical representation ability test score of at least 70; obtained the t count value = 5.1777 while the t table = 1.729 so that the  $t \text{ count} > t \text{ table}$  which means that the average mathematical representation ability of students who get CORE learning assisted by Canva is more than the KKM which is 70; obtained z count value is 2.537081 while z table is 1.64 so that  $z \text{ count} > z \text{ table}$  the proportion of completeness of students who get CORE learning assisted by Canva is more than the proportion of completeness of students with scientific learning; obtained t count value is 3.605517 while t table is 2.0315 so that  $t \text{ count} > t \text{ table}$  which means that the average mathematical representation ability of students who get CORE learning model assisted by Canva is more than the mathematical representation ability of students with scientific learning; and obtained significant value is  $\text{sig} = 0.000 = 0\% < 5\%$  which means there is a linear relationship between self-efficacy and mathematical representation ability, or it can be said that self-efficacy has a positive effect on mathematical representation ability. This is in line with research from Darozatun et al. (2021) which states that there is an increase in mathematical representation ability among students who use the CORE learning model.

The following is a table of self-efficacy categorization of 20 research subjects. This research subject is based on the results of filling out the self-efficacy questionnaire conducted in the experimental class. The results of data presentation from research subjects in terms of self-efficacy are categorized in Table 1 below:

**Table 1.** Grouping of Self Efficacy Categories of research subjects

No	Self Efficacy Categories	Total subject	L	P
1	<i>Self Efficacy</i> Low	5	2	3
2	<i>Self Efficacy</i> Medium	10	9	1
3	<i>Self Efficacy</i> High	5	4	1

The purpose of this study is to describe the mathematical representation ability of students on the implementation of the CORE learning model assisted by Canva in terms of self-efficacy. Based on the results of the mathematical representation ability test, there are 5 subjects in the low self-efficacy category, from these 5 subjects there are 3 subjects who get KKM scores and 1 subject gets high representation ability. This is in line with the results of research by Nugraha & Prabawati (2019) which states that subjects will be able to overcome a problem in their learning, have confidence when overcoming problems, and overcome difficulties. This confidence can still apply to various situations if the teacher continues to foster subject confidence and guide them. Subjects who get low self-efficacy will have difficulty in learning, but if the teacher patiently continues to guide and foster subject confidence to solve the problems they face.

Based on the results of the mathematical representation ability test, there were 10 subjects in the medium self-efficacy category, of the 10 subjects got the KKM score. Of the 10 subjects in the medium self-efficacy category, 7 subjects got high representation skills. This is in line with the results of research by Said et al. (2021) which states that students with medium self-efficacy do not experience significant difficulties in solving a problem by expressing their abstract ideas in the form of mathematical representations. Based on the results of the mathematical representation ability test, there are 5 subjects in the high self-efficacy category, out of these 5 subjects got the KKM score. Of the 5 subjects in the high self

There are 4 subjects in the high efficacy category who have high representation skills. This is in line with the results of research by Said et al.

(2021) which states that students with high self-efficacy can use all mathematical representation indicators optimally compared to students with moderate and low self-efficacy. In addition, Gao (2020) also argues that individuals who have high self-efficacy will achieve a better performance because these individuals have strong motivation, clear goals, stable emotions, and the ability to perform activities or behaviors successfully.

## CONCLUSION

Based on the analysis and discussion in the previous chapter, the results showed that the mathematical representation ability of 20 research subjects showed a positive effect of self-efficacy on students' mathematical representation ability, which was categorized into low, medium, and high categories.

The mathematical representation ability of students in terms of self-efficacy varies, in the low, medium, and high categories. Subjects with low self-efficacy were 5 (25%), subjects with medium self-efficacy were 10 (50%), and subjects with high self-efficacy were 5 (25%).

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