Vol. 5, No. 1 (2021) 50-62 ISSN: 2597-4866

Indonesian Journal of Primary Education

Application of the Concrete-Pictorial-Abstract (CPA) Approach to Improve Elementary Students' Spatial Sense

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Received 08 May 2021; Revised 21 June 2021; Accepted 30 June 2021
Published 30 June 2021

Abstract

The purpose of this research is to find out the increase of the Spatial Sense (SS) in the elementary school students through Concrete Pictorial Abstract (CPA) approach viewed from the Prior Mathematics Ability (PMA). The method was the quasi-experimental with pre-test and post-test design control. The topic focused on geometry involving as many as 119 5th grade students from 2 elementary schools in Karawang. The sample was taken through the purposive sampling technique. The instrument was through the test to measure SS and PMA as well as the non-test to observe the students. Descriptively, the increase of SS in the students through the CPA approach was higher than those who learned with the conventional one. Based on inferential statistic test, the increase of the Spatial Sense towards the medium and low PMA groups reaches a p-value 0.000 and 0.001<0.05. It means that the increase of the Spatial Sense through the CPA approach was better. However, the increase of the Spatial Sense towards the high PMA reaches p-value 0.102>0.05, showing that there was no significant difference. Thus, CPA approach is considered a good alternative to increase the students' SS on the high, medium, and low PMA for students in the upper grades.

Keywords:*Spatial Sense, Prior Mathematical Ability, Concrete Pictorial Abstract*

Abstrak

Penelitian ini bertujuan untuk mengetahui peningkatan spatial sense (SS) siswa sekolah dasar melalui Pendekatan Concrete Pictorial Abstrac (CPA) ditinjau Kemampuan Awal Matematis (KAM). Metode penelitian melalui kuasi eksperimen dengan desain kontrol pretes dan postes pada topik bangun ruang terhadap 119 siswa kelas lima di dua sekolah dasar negeri di Karawang. Teknik penentuan sampel melalui purposive sampling. Instrumen melalui tes untuk mengukur SS dan KAM serta non-tes untuk mengobservasi siswa. Secara deskriptif peningkatan SS siswa pada pendekatan CPA lebih tinggi dibandingkan yang mengikuti pembelajaran konvensional yang dapat diketahui pada n-gain siswa KAM tinggi, sedang dan rendah berturut-turut sebesar 0,514; 0,380; dan 0,316 (sedang), sedangkan kelompok konvensional n-gain siswa KAM tinggi sebesar 0,361 (sedang), KAM sedang dan rendah berurutan 0,135 dan 0,065 (rendah). Secara Inferensial peningkatan SS pada kelompok KAM sedang dan rendah memiliki p-value 0,000 dan 0,001<0,05 sehingga peningkatan SS melalui pendekatan CPA lebih baik. Selanjutnya peningkatan SS kelompok KAM tinggi memiliki p-value 0,102>0,05 artinya tidak berbeda secara signifikan. Dengan demikian CPA dianggap menjadi alternative dalam meningkatan SS siswa pada KAM tinggi, sedang dan rendah pada siswa kelas tinggi.

Kata Kunci: Spatial Sense, Kemampuan Awal Matematis, Pendekatan CPA.

INTRODUCTION

Learning is a process in which teachers and students interact and influence each other to achieve certain goals. Rusman (2014, p. 3) explains that, "learning is a process of interaction of students with teachers and learning resources in a learning environment that needs to be planned, implemented, assessed, and supervised in order to be carried out effectively and efficiently."

The learning process is carried out with reference to the curriculum. Hamalik (2012, p. 16) states that, "the curriculum contains the contents of the subject matter, the curriculum as a lesson plan, and the curriculum as a learning experience." Mathematics is a science that is very useful in everyday life. Various fields of human activity have mathematical aspects in them, such as numbers, calculations, spatial sense and so on. One of the subjects of mathematics lessons taught to elementary school students is

geometry. The National Council of Teachers of Mathematics or NCTM (Farina, 2016) describes four geometry skills that students must possess, namely:

1) Able to analyze the character and properties of geometric shapes, both two-dimensional and three-dimensional, and able to build mathematical arguments regarding geometric relationships with others; 2) Be able to determine the position of a point more specifically and describe the spatial relationship using other geometric coordinates; 3) application of transformation and use systematically to analyze mathematical situations; 4) use visualization, spatial reasoning and geometric models to solve problems.

Geometry is related to spatial sense. According to Braconne and Marchand (2012), "learning geometry, especially spatial shapes can improve students' spatial sense." Lestari and Yudhanegara (2015, p. 85) state that, "spatial sense is the ability to imagine, compare, guess, determine, construct, represent, and find information from visual stimuli in the context of a room."

Spatial intelligence is one of 8 multiple intelligences which includes logical-mathematical intelligence, verbal linguistic intelligence, visual-spatial intelligence, musical intelligence, kinesthetic intelligence, emotional intelligence, naturalist intelligence, intuitive intelligence, moral intelligence, existential intelligence, and spiritual intelligence (Gardner in Wardhani, Irawan and Sa'dijah, 2016, p. 905).

Putri (2017, p. 17) states that, "spatial sense is a part of geometrical abilities related to two-dimensional shapes (flat shapes) and three-dimensional shapes (space shapes)." The fact about the importance of spatial sense does not match the ability of students who are lacking in understanding geometry.

This lack of spatial sense ability is in line with research conducted by Saptini (2016) which states that the ability of elementary school students to work on geometric problems is still low. This is based on a preliminary study that has been conducted by Saptini in one of the elementary schools regarding the volume of geometric shapes. This low spatial sense ability is also in accordance with a study conducted by Putri (2017) which examined the effect of the Concrete-Pictorial-Abstact (CPA) approach on the achievement of elementary students' spatial sense (KSS) abilities.The lack of students' spatial sense is caused by the teacher's tendency to teach by introducing numbers and formulas to students. Teaching with lecture methods, writing and practice questions as the teacher teaches according to what has been taught to him before. Students are only required to know numbers and formulas that can be used to be applied in solving problems.

Learning tends to be teacher-centered, which causes students to get bored easily so they don't pay attention to what the teacher is teaching and explaining as a whole. Student activities are limited, they can only pay attention, listen and understand the teacher's explanation and see examples written on the blackboard.

Seeing these problems, it is necessary to make changes and different solutions in the learning process. One of the learning solutions that are deemed appropriate is the application of the Concrete-Pictorial-Abstract (CPA) approach. The Concrete-Pictorial-Abstract (CPA) approach was chosen because it was appropriate to the child's cognitive level. Where according to Riccomini (2010), "important elements in CPA learning consist of three parts, namely: (1) teaching concrete understanding, using appropriate concrete objects, (2) teaching representational understanding (pictorial), using appropriate images, (3) use an appropriate approach to help students move to the stage of abstract

understanding of a mathematical concept by using explicit learning."

The Concrete-Pictorial-Abstract (CPA) approach is a learning approach that is carried out in stages. The stages in the concrete-pictorial-abstract approach are mutually continuous and sequential, where each stage is built on the previous stage so that it must be done sequentially. Several studies have stated that the CPA approach is beneficial for students in solving problems in learning mathematics.

One of the studies that has applied the CPA approach is the research conducted byby Putri (2017) where the CPA approach can benefit all students, as it has been shown to be very effective with students with math difficulties. Another study was also conducted by Julianti (2017) regarding the effect of the Concrete-Pictorial-Abstract (CPA) approach on increasing the spatial senses of elementary school students. The results of the research conducted by Julianti (2017) are, "in general the achievement and improvement of spatial sense abilities of students who receive learning with the CPA approach is better than students who receive conventional learning."

The problem studied in this study is whether there is an increase in the spatial sense of students who receive learning using the Concrete-Pictorial-Abstract (CPA) approach better than students who receive conventional learning in terms of the students' Initial Mathematical Ability (KAM) (high, medium, and low). low)?. The hypothesis of this research is that there is an increase in the spatial sense of students who receive learning with the CPA approach better than students who receive conventional learning, in terms of KAM (high, medium, and low).

The purpose of this study was to comprehensively analyze the increase in spatial sense of students who received learning with the Concrete-Pictorial-Abstract (CPA) approach better than students who received conventional learning in terms of the students' Initial Mathematical Ability (KAM) (high, medium, and low).).

METHOD

The type of research used in this research is quasi-experimental research. Lestari and Yudhanegara (2015, p. 136) suggest that, "this design has a control group, but it cannot fully function to control external variables that affect the implementation of the experiment." The design that the researcher chose was the Noneequivalent Control Group Design. In this design the experimental group and the control group were not chosen randomly, Sugiyono (2016, p. 79).

The population of this study were all elementary school students in Purwasukasih. The research was conducted in the second semester of Mathematics subject, the subject of volume building of cubes and blocks. This sampling technique was carried out using a purposive sampling technique or a purposive sample, namely "the technique of sampling data sources with certain considerations" (Sugiyono, 2015, p. 176). The sample in this study was grade 5 students in the second semester of a public elementary school in Cikampek sub-district, whose address is Sukamanah Village, West Cikampek Village, Cikampek District, Karawang Regency, West Java Province. Some of the considerations are 1) Class V is in the age range of 10-11 years where the development of children according to Piaget aged 7-11 years is in concrete operations and 11-12 years in formal operations,

The reason that SDN Cikampek was chosen as the research location is because this school has an A accreditation where in general the elementary schools in Purwasukasih have an A accreditation. The subjects sampled were a total of 119 students

consisting of 59 students in the experimental group and 60 students in the control group.

The type of data obtained from this study consisted of two types of data, namely quantitative data and qualitative data, so that in analyzing the data, two types of analysis were carried out, namely quantitative data analysis and qualitative data analysis. Quantitative data were obtained from the results of the KAM test and spatial sense tests on the pretest and posttest, while the qualitative data was in the form of student observation data.

The procedure of this research was started with the KAM test in the experimental class and the control class, then a pretest was given, followed by treatment. When the treatment has been given, at the end of the lesson, students take the final test (posttest) and the next stage of research is to analyze the data. The type of data obtained from this research consists of two types of data, namely quantitative data and qualitative data. Quantitative data were obtained from the results of the KAM test and spatial sense tests on the pretest and posttest, while the qualitative data was in the form of observational data. Descriptive analysis of the increase in students' spatial sense was seen through analysis of normalized gain scores. The formula used to calculate the normalized gain is as follows.

$$<g> = \frac{skor\ posttest - skor\ pretest}{skor\ ideal - skor\ pretest}$$

Then <g> is written as N-gain. The N-Gain category according to Meltzer (Putri, 2015) is as follows.

Table 1
N-gain criteria

N-gain interval	N-gain criteria
<g> < 0.3	Low
0.3 <g> < 0.7	Currently
0.7 <g>	Tall

Inferential analysis was conducted to analyze statistically the increase in spatial senses of students who received CPA learning compared to students who received conventional learning when viewed from the KAM group. The steps taken in inferential analysis are hypothesis testing on the normalized gain data from students' SS based on KAM groups. After inputting the data, a hypothesis test will be conducted to determine the equivalence of the Students' Initial Ability (KAM) and the improvement of SS. Testing the analysis requirements in question is a data normality test of all quantitative data carried out by testing. Kolmogorof-Smirnov and the homogeneity of variance test through Levene's test. Test all research hypotheses with t-test, t-test, and Mann-Whitney U test.

RESULTS AND DISCUSSION

1. First study

This study conducted a KAM test with the aim of seeing the equivalence of students' initial mathematical abilities between the experimental group (a group of students who received learning with the CPA approach) and the control group (a group of students who received learning with a conventional approach). In accordance with Putri's opinion (Yulianto, Turmudi, Agustin, Putri, and Muqodas, 2019)KAM test is intended to classify students based on their abilities (high, medium, and low) and observe the similarities of KAM in two groups, namely the group of students receiving CPA learning and groups of students receiving conventional learning.

Based on the results of the overall KAM test of students in the two research groups, students can then be classified into three KAM criteria, namely students with high, medium, and low KAM criteria. Description of student KAM criteria based on data from KAM test results in both research groups, namely for the KAM score interval$x$13 criteria are high, 2 x < 13 is moderate, and x < 2 is low.

To find out in more detail the descriptive KAM of students based on the KAM group, the average calculation is carried out($\bar{x}$) and standard deviation (SD) for students based on the KAM group. The recapitulation of KAM test results based on learning is as follows.

Table 2
Recapitulation of Student KAM Test Scores based on Learning

Learning	KAM Group						Ideal Maximum Score
	Tall		Currently		Low		
	$\bar{x}$	*SD*	$\bar{x}$	*SD*	$\bar{x}$	*SD*	
CPA	15.56	2.66	6.26	3.47	0.44	0.53	20
Conventional	15,70	2.54	6.95	2.91	0.55	0.52	

SMI= 20

It can be seen that the average ($\bar{x}$) and the standard deviation (SD) between the KAM test scores of students who will receive CPA learning and conventional learning in terms of the KAM group is relatively not much different. In this case, the average KAM score of students who will receive conventional learning is slightly higher than students who will receive CPA learning. The standard deviation (SD) of KAM students who will receive conventional learning is slightly lower than students who will receive CPA learning. The results of this analysis, strengthen the conditions can be eligible to provide different treatment in the two research groups.

Inferential analysis of KAM data, the hypothesis testing criteria used is if the p-value (sig. 2-way) is less than 0.05, then H0 is rejected, and in other cases H0 is accepted.The following is a recapitulation of the results of the equivalence test (mean difference) of KAM for high group students.

Table 3
Recapitulation of Students' Average Differences in KAM Test Results viewed from the High KAM Group

Learning	Average	t_{count}	*df*	t_{table}	*p-value*(sig.2-way)	Information
CPA	17.6429	-0.130	24	-2.064	0.899	H0 accepted
Conventional	18,1000					

Based on the data in Table 3, it appears that there is no difference in student CAM between the two learning groups in the high KAM group.

Table 4
Recapitulation of Students' Average Differences in KAM Test Results in terms of the Medium and Low KAM Group

KAM Group	Learning	Test *Mann-Whitney*	*Z*	*p-value* (sig.2-way)	Information
Currently	CPA / Conventional	574,5000	-0.984	0.325	H0 accepted
Low	CPA / Conventional	44,500	-0.438	0.661	H0 accepted

The data recapitulation of the average difference test results presented in Table 4 shows that there is no difference in students' KAM between the two learning groups for the medium and low KAM groups.

Based on descriptive and inferential analysis, the average KAM of students does

not differ between groups of students who will receive learning with the CPA approach and groups of students who will receive conventional learning. This situation qualifies to provide different treatment between the two learning groups. If there is a difference in the increase in spatial sense after the learning is carried out, then the difference is due to the treatment (application of the learning approach) not because of KAM.

The criteria for the student KAM group in this study are known that the number of students with high, medium and low KAM in the two learning groups is not much different. The test data for the KAM test results in this study showed that there was no difference in the students' initial mathematical abilities in the two groups of students who would take part in the lesson. This means that there is an equality of student KAM in the two research groups. This condition qualifies to provide different treatment between the two research groups. Thus, if there is a difference in the improvement of students' SS between the two groups at the end of the lesson, it may be possible that the difference is due to differences in treatment not due to differences in initial abilities. This is in accordance with the opinion of Yumiati (2015) which states that, "The equivalence of KAM between the two research groups (experimental and control groups) is important, because it is a requirement to be able to give different treatment to the two research groups." Furthermore, the grouping of students based on the KAM category will be used to answer some of the problems regarding the improvement of students' Spatial Sense (SS) raised in this study.

2. Pre test and Post test results

The results of the research pre-test and post-test are as follows:

Table 5
Pre-test and Post-test results of Spatial Sense Control Class and Experiment Class

	Control Class			Experiment Class		
	Pre test	**test post**	**Difference**	**Pre test**	**test post**	**Difference**
Amount	85	209	124	74	399	325
Average (Mean)	1.42	3.48	2.07	1.25	6.76	5.51
The highest score	5	13	10	3	15	13
Lowest Value	0	0	0	0	0	0
Standard Deviation	1.17	2.83	2.19	0.92	3.85	3.52
variance	1.37	8.02	4.81	0.85	14.80	12.36

The results of the pre-test and post-test in the control class and the experimental class were different. The results of the post-test in the experimental class improved more than the results of the post-test in the control class.

3. Analysis Results

Table 6
N-Gain Spatial Sense Recapitulation of Students based on Learning viewed from the KAM Kelompok Group

KAM Group	Learning	N-gain score		$\bar{x}$	*elementary school*
		Smallest	Biggest		
Tall	CPA	0.071	1,000	0.514	0.288
	Conventional	0.000	0.833	0.361	0.291
Currently	CPA	0.000	1,000	0.380	0.244
	Conventional	0.000	0.500	0.135	0.137
Low	CPA	0.000	0.929	0.316	0.292
	Conventional	0.000	0.154	0.065	0.061

The data shows that the increase in student SS for each group of KAM students who received learning with the CPA approach was higher than students who received conventional learning. In each KAM group in the two learning groups, the improvement in students' SS was in the medium criteria. However, the increase in SS of students who received conventional learning in the medium and low KAM groups was in the low category. In both learning groups, the increase in SS of students in the high KAM group was higher than in the medium and low KAM groups, as well as the increase in the SS of students in the medium KAM group was higher than in the low KAM group.

Table 7
Recapitulation of the Average Differences in Students' Spatial Sense Improvement in terms of the High KAM Group with t test

Learning	Average	t_{count}	*df*	t_{table}	*p-value* (sig.1-way)	Information
CPA	3,610	-1,304	2	2.06	0.102	H0 accepted
Conventional	5,131		4	4		

Data on the increase in SS in the medium and low KAM groups were immediately carried out by non-parametric tests, because the data were not normally distributed. The non-parametric test used is the Mann-Whitney U test.

Table 8
Recapitulation of the Average Differences in Students' Spatial Sense Improvement in terms of the Medium and Low KAM Group

Group TAM	Learning	Test *Mann-Whitney U*	Z	*p-value* (sig.1-way)	Information
Currently	CPA	255,000	-4,538	0.000	H0 rejected
	Conventional				
Low	CPA	10,500	-3,010	0.001	H0 rejected
	Conventional				

Thus, it can be concluded that the increase in SS of students who received learning with the CPA approach was better than students who received conventional learning, when viewed from the medium and low KAM groups. Meanwhile, the increase in SS of students who received learning with the CPA approach was not significantly different from students who received conventional learning, if viewed as a group, KAM was high.

4. Discussion

Student learning activities during mathematics learning by applying the Concrete-Pictorial-Abstract (CPA) approach in the experimental class and learning in the control class have increased every meeting.

Teacher activities were carried out with observers from the classroom teacher where the study was conducted for seven meetings. The activity of the teacher in the experimental class at each meeting increased. The teacher carries out the learning process according to the steps of the CPA approach. The teacher is considered very good at the preparation stage for class management, manipulation of concrete objects, pictures, and mathematical symbols. Teachers are also very good at fostering active student participation in learning and showing appropriate teaching styles. Likewise, the teacher's activities in the control class, the teacher was considered very good at involving students, conveying good explanations, and giving students the opportunity to solve problems of building space. Teachers are also considered very good in fostering active participation of students in learning and showing appropriate teaching styles.

The CPA approach can be used as an alternative learning approach to develop students' SSA (Putri, 2019). The results of the research by Fuchs and Hollenbeck (Flores, 2010) concluded that, 'the CPA approach has proven to be effective in teaching place value, geometry, and fractions.'

According to Salingay and Tan (2018), what makes the CPA class unique is that topics are presented in three ways. The first is concrete, the second is the use of images and the last is the use of symbols. The selection of CPA in this study was based on the consideration of several research results. Based on the research results of Maulani, Asih and Alamsyah (2020) concluded that the ability to understand mathematical concepts using the Concrete-Pictorial-Abstract approach is better than the Scientific approach in class V Mathematics. The results of the study by Salingay and Tan (2018) stated that during the retention test, the average CPA score was significantly higher than non-CPA.

Learning with the CPA approach in this study has been designed to develop and improve students' SS. The tasks in this learning are presented in the form of Student Worksheets (LKK). Each LKK is designed to refer to the material of Flat Shapes and Spaces, the main volume of cubes and blocks, SS indicators and learning stages with the CPA approach.

Based on the results of the study, it was found that in general the improvement in SS of students who received learning with the CPA approach was better than students who received conventional learning. It is better to increase the SS of students who get learning with the CPA approach than students who get conventional learning can be explained through the stages of learning with the CPA approach as follows.

a. *Concrete*

SS is trained through direct student activities, this stage provides opportunities for students to practice and demonstrate mastery of manipulating concrete objects or doing activities related to mathematical concepts. Through this activity, teachers can identify students' conceptual understanding and reactivate students' prior knowledge related to the material to be studied. At this stage students can also re-evaluate their conceptual

understanding of the material being studied. This situation is in line with Hartshorn's opinion (Putri, 2015) which states that, 'applying ideas to Mathematics is difficult, partly because mathematics is very abstract. One practical way to provide a learning experience is the use of concrete (manipulative) objects.'

b. *Pictorial*

At this stage students are trained to model mathematical concepts at the semi-concrete level which is carried out with the process of images. The pictures made by students represent concrete objects that are manipulated when solving problems at the concrete stage. At the level of understanding Pictorial or drawing, students learn to complete a task according to what the teacher has given by describing an object according to what they have understood. The activity of making a picture of a problem situation related to the real world is a necessary activity.

The above activity requires students to make pictures to complete the task. The activity of making a picture of a problem situation related to the real world is an activity that needs to be developed as a bridge that helps students from the concrete stage to the abstract stage. This situation is in accordance with the statement of Ramadhan (2012) which states that, "learning by developing at the visual stage can make it easier for students to understand mathematics learning in problem solving." Therefore, the teacher's role is needed in the concrete, pictorial or image stage, to push the learning experience to a more abstract level.

c. *Abstract*

The third stage is abstract or symbolizing. At this stage students symbolize mathematical concepts at the Pictorial stage by using abstract mathematical symbols to become a problem model. With the data obtained at the concrete stage, students can symbolize the terms commonly used in the material using numbers, notation, or mathematical symbols.

The success of learning using the CPA approach in developing and improving students' SS in this study is in line with the results of previous research conducted by Bernard (Putri, Rahayu, and Saptini, 2016) namely, 'providing students a structured way to learn mathematics by building better relationships as it moves through the levels of understanding from the concrete to the abstract.' This is in line with the results of research conducted by Rahmawati (Suryani, 2017) that, 'learning using the CPA approach is able to get a positive response to students' thinking processes at the abstract level in solving mathematical problems for students.'

Learning with the CPA approach provides many opportunities for students to develop their thinking and is proven to make students feel happier or happier in learning and feel challenged. By using this approach, students will understand the material they have mastered and the subject matter will be easier to understand and remember by students. Thus it can be said, when students find difficulties in solving mathematical problems, they will be able to create images that are similar to the use of manipulation of concrete objects.

Analysis of research results based on the KAM group. The analysis of the study showed that there were differences between students who received learning with the CPA approach and students who received conventional learning in both lessons in the high KAM group, and showed no difference between students who received learning with the CPA approach and students who received learning with the CPA approach. get conventional learning in both learning in the medium and low KAM groups.

Slightly different from the inferential analysis of research results, descriptive analysis of research results showed that the increase in SS of students who received CPA

learning was higher than students who received conventional learning in terms of the medium and low KAM groups. The results of this study are in accordance with the results of Dwirahayu's research (2012) which concludes that, "there is no significant difference in increasing visualization ability between students who receive exploratory learning and students who receive conventional learning, but the average value of the increase in visualization abilities of students who receive learning is exploratory learning is higher than students who get conventional learning. Visualization ability is part of spatial sense ability.

SS students who receive learning with the CPA approach are more developed and better than SS students who receive conventional learning are possible, because the stages of learning activities with the CPA approach provide many opportunities for students to gain the necessary experience at a visual level where spatial sense abilities can be developed. . One way to develop spatial visualization skills is to use paper media where students are given complex images and then asked to find simple shapes and present ideas or answers through image presentations (Dwirahayu, 2012).

In accordance with the results of research by Fuchs and Hollenbeck (Flores, 2010) which concluded that, 'the CPA approach has proven to be effective in teaching place value, geometry, and fractions.' Of course, when students learn geometry, indirectly students have also learned spatial sense. This is the same as the opinion of Braconne and Marchand (2012) which states that, "learning geometry, especially building space can improve students' spatial sense." The material used in this research is geometric material about the volume of the building.

Despite the increase in SS, students who received learning with the CPA approach were more developed and better than students who received conventional learning. However, the increase in student SS is still not maximal, the increase in SS is still in the moderate criteria. This is possible because of the short research time (2 months). This situation is in accordance with the opinion of Riccomini (2010) which states that, "if students have not mastered the concept/skill at the concrete stage or at the representation stage (pictorial) or at the abstract stage, then teachers are advised to repeat learning at stages that have not been mastered by students, this situation requires more time. Another factor is the less than optimal increase in the student's SS, maybe because students are not familiar with the application of learning using the CPA approach in classroom learning. This is in accordance with Brune's opinion (Yumiati, 2015) which states that, 'when implementing a new learning method in the classroom, teachers will have difficulties, because students need time to adapt to their new roles.

From the various discussions above, it can be concluded that the application of learning with the CPA approach can be used as one way that can be used to improve students' SS. As stated by Arvianto and Masduki (Yulianto, Putri and Rahayu, 2019) that one of the advantages of doing learning with the CPA approach, students can understand the meaning of learning, therefore the application accompanied by appropriate steps starting from the concrete, pictorial, abstract stages will have a positive influence .

CONCLUSION

Based on the results of the study, it can be concluded that in general the increase in spatial sense of students who receive learning with the CPA approach is higher and better than students who receive conventional learning. In detail, the conclusions of the results of this study are as follows:

1. In the high KAM group, the increase in spatial sense of students who received learning with the CPA approach was not

significantly different from students who received conventional learning. Increased spatial sense of students who get CPA and conventional learning are in the high category. Descriptively in the high KAM group, the increase in spatial sense of students who received conventional learning was better than students who received learning with the CPA approach.

2. In the medium and low KAM groups, the increase in spatial sense of students who received learning with the CPA approach was better than students who received learningconventional. The increase in spatial sense of students who get CPA learning is in the medium category and conventional is in the low category.
3. The learning activities of fifth graders at the research school have increased in the mathematics learning process by applying the Concrete Pictorial Abstract (CPA) approach. This can be seen from the results of observations that have been made from the first meeting to the seventh meeting from the moderately increasing category to the very good category.

ACKNOWLEDGEMENT

The authors would like to express their deepest appreciation and gratitude to the relevant schools who have provided time, assistance, patience, and invaluable guidance and advice during this research.

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