



The Effect of Contextual Learning Approach to Mathematical Connection Ability and Student Self- Confidence Grade Viii Smp Negeri 8 Medan

Rusmini^{a*}, Edy Surya^b

^aStudent of postgraduate program, State University of Medan

^aEmail: rusminiponsan@yahoo.co.id

Abstract

This research aims to: (1) to know the influence of contextual learning approach to mathematical connection ability and self-confidence grade VIII students of SMP Negeri 8 Medan. (2) to find out whether there is a significant interaction between learning and students' early math ability on mathematical connection ability and student self-confidence. Quasi experimental methods. The sample was taken randomly The subjects of 68 students consisted of the experimental class and the control class. Mathematical connections ability test consists of 5 items of description and 30 items self-confidence questionnaire students. Data analysis was performed by two-lane variance analysis. Based on the analysis result of contextual learning approach gives a significant influence on mathematical connection ability and student self-confidence. There is no significant interaction between mathematical learning (contextual, ekspositori) and mathematical early ability of students on mathematical connection ability and student self-confidence.

Keywords: Contextual Learning Approach; Mathematics Learning; Mathematical Connection and Student Self Confidence.

1. Introduction

Mathematics as one of the school subjects has certain features and characteristics. One characteristic of mathematics is its abstract object [24].

* Corresponding author.

To understand the object or concept of mathematics that is abstract activity required students' participation in learning. Mathematics is related to each other, and it can not be separated from other disciplines and problems in everyday life. Based on the curriculum of 2013 [6], that the purpose of learning mathematics is "that students understand the concept of mathematics, explain the inter-linkage of concepts and apply the concept or algorithm flexibly, accurately, efficiently, and precisely in problem solving". Based on the above learning objectives, one aspect emphasized in the 2006 curriculum and National Council of Teachings of Mathematics [20] is the mathematical connection ability of students and mathematics learning is prepared so that students can solve the problem in the future by connecting Problems with mathematical concepts and other fields of science, so what has been learned in school is useful in life. In line with the National Council of Teachings of Mathematics [20] mathematics can not be separated from science other than mathematics and the problems that occur in life. Without a mathematical connection then students must learn and remember too many separate mathematical concepts and procedures. This opinion suggests the importance of connection in mathematics learning. Through connections, students can relate mathematics to the real life that is felt important by students [3]. In addition to the importance of mathematical connection ability in mathematics learning, also required attitudes that must be possessed by students in learning mathematics, such as (1) Direction or targets to be achieved, (2) motivation, (3) stable emotion, (4) Positive thoughts (5) self-awareness, (6) flexibility in behavior, (7) the spirit to develop, (8) health and energy, (9) willingness to take risks, (10) have goal to succeed, are indicators of student self-confidence according to Burton & Platts [1]. Self-confidence is defined as behaviors that make the individual have a positive and realistic view of themselves or the environment or situation they are facing [7]. Self-confidence is a person's assumption about his / her abilities in dealing with various things. Related to math, Mo Leod reveals that self-confidence is a belief in self-competence in mathematics and a person's ability in mathematics which is the result of learning and practice doing mathematical problems [16]. Self-confidence is very important for students to succeed in learning mathematics [29]. The formation of self-confidence of students in learning mathematics is a complex process, including interaction with several factors such as: family, socialization, school experience, relationship with cultural rules [17]. Preston (23) reveals there are 5 aspects of self-confidence builders are: self-awareness, intention, thinking, imagination, and acting' as if. Associated with mathematics, Margono [16] reveals that the self-confidence of students in learning mathematics can be divided into three aspects, namely: (1) belief in understanding and self-awareness of math ability, (2) the ability of self to determine realistically Goals to be achieved and formulate action plans as an attempt to achieve goals, (3) belief in mathematics itself. Furthermore, by understanding the aspects that affect the formation of student self-confidence, especially in the learning of mathematics, the teacher can choose a learning approach that accommodates the development of self-confidence students. With the self-confidence, students will be more motivated and prefer to learn math so it is expected to affect students' mathematical connection ability. The ability of mathematical connections and self-confidence of students in learning mathematics is influenced by various factors. One of the influencing factors is the accuracy of the learning approach used. Many learning approaches are used in the learning process, one of the learning approaches that can help teachers relate the material taught to the real-world situations of the students and encourage students to make connections between their knowledge and application in their daily lives and those capable of developing self-confidence Student is a contextual learning approach. The contextual learning approach leads students to construct their own new knowledge and skills when students learn. Contextual learning involves seven main components of productive

learning: constructivism, questioning, inquiry, learning community, modeling, reflection, and actual assessment Assessment) [5]. Components that exist in the contextual learning approach can affect the ability of mathematical connections and the development of self-confidence students, because the component (1) konstruktivisme, mathematical connection occurs when students construct the knowledge they have to relating with new knowledge so that Train students' mathematical connection skills. Relating is learning in the context of a real-life experience or beginning before the knowledge is acquired by the student. Teachers use relating when they try to relate a new concept to something that students already know, (2) on the inquiry component, the students try (experiencing). At experiencing they may have no direct experience with the concept. However, in this section the teacher should be able to provide hands-on activities to the students by practicing for example making a flat circular wake. Students can "construct" not "receive" knowledge, applying applying concepts also required students' mathematical connection ability. Application of concepts when students deal with problem solving activities during practice. (3) teachers motivate by providing relevant exercises or examples (modeling), students need self-confidence to convince the ability that students have to make a decision, (4) cooperating. Working together in the context of sharing, responding, (5) communicating (questioning) with other students is a factor in developing student self-confidence, it is also consistent with regard to real life in contextual learning approaches, (6) reflection process is final Of activities. Students store what has been learned as a new knowledge structure that is an enrichment or revision of prior knowledge. So that meaningful knowledge is obtained at the time of reflection, (7) the actual assessment, in this process the teacher knows the ability of mathematical connections and self-confidence of students at the time of learning or as an evaluation whether the learning is in accordance with the objectives to be achieved. Based on the above description it can be concluded that the contextual learning approach seen emphasizes the students to make the relationship between concepts, the relationship of concepts with real problems. Students find answers and beliefs with something students find on their own, then to solve problems students are trained in their mathematical connection ability. The problem presented is a real problem so that learning becomes more meaningful. This is one of the reasons why contextual learning approach is a learning approach that can affect the ability of mathematical connections students can also develop self-confidence students. Berns and Erickson [2] say that, Contextual Teaching and Learning is a conception of teaching and learning that helps teachers relate subject matter content to real world situations; And motivates students to make connections between knowledge and its applications to their lives as family members, citizen, workers and engage in the hard work that learning requires. According to Johnson [25] argued that the contextual learning approach is an educational process that aims to help students see meaning in the lesson material they learn by connecting it with their daily life context, with the context of their personal, social, And culture. Contextual is much influenced by the philosophy of constructivism. Jean Piaget is one of the pioneers who was mentioned as a pioneer of the flow of constructivism. One of his many thought contributions is used as a reference for understanding individual cognitive development: the theory of individual developmental stages. According to Piaget [28] that the stages of individual cognitive development include four stages: (1) sensorimotor; (2) preoperational; (3) concrete operations and (4) formal operations. According to Gagne that in learning happens the process of receiving information, to then processed so as to produce output in the form of learning outcomes. In information processing there is an interaction between the internal conditions and the external conditions of the individual. The internal condition is the state in the individual that is necessary to achieve the learning outcomes and cognitive processes that occur within the individual. While

external conditions are the stimuli of the environment that affect the individual in the learning process. Each concept or principle in mathematics presented in a concrete form would be well understood. This implies that objects or objects in the form of games will play a role when manipulated well in the teaching of mathematics. The more different forms that are given in certain concepts, the more clearly the concept will be understood by the child, because the children will acquire the logical and mathematical things in the concept he learns. The quality of mathematics learning is also supported by students' early skills. According to [16] who said that "the initial ability prerequisite preliminary to know the existence of change". The student's early ability is important for teachers to provide the right dose of learning, not too difficult and not too easy. Initial ability is also useful for taking the necessary steps. Students' initial skills are different, so the ability to follow different lessons. So students who have a good initial ability will more quickly understand the material compared with students who do not have the initial ability in the learning process. This is in line with research [10] hat the early ability of mathematics affect the results of learning mathematics. The grouping of students based on early mathematical abilities is intended to see if there is a mutual influence between the learning approach and the student's early mathematical ability on the development of mathematical and self-confidence connection capabilities. This indicates that early ability will affect the ability of mathematical connections and self-confidence of students on learning mathematics in the classroom. Low early math skills will affect the ability of mathematical connections and student self-confidence is also low. The low ability of mathematical connections and self-confidence of students based on data obtained from interviews with mathematics teachers SMP Negeri 8 Medan, many students who do not understand when given the problem in the form of a story, such as the example of the following questions: Mrs. Ani will create a garden behind his house . The garden is done by the builder of the garden with the shape shown in Figure 1 The shaded area is the area that will be planted roses. Image scale: 1 cm represents 2 meters. How much is the whole area to be planted by Ani? If wages planted 1 meter square of flower Rp.10.000., How much money should be paid bu Ani to the parkers?

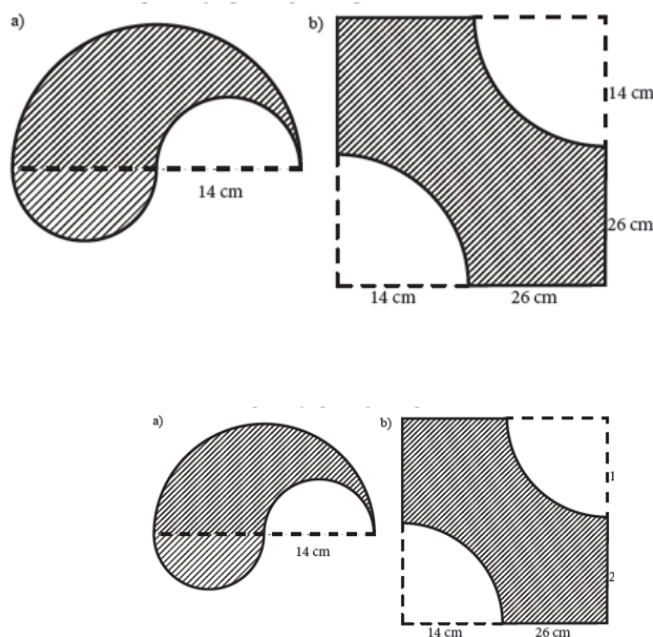


Figure 1: Shape of Mrs Ani's Garden

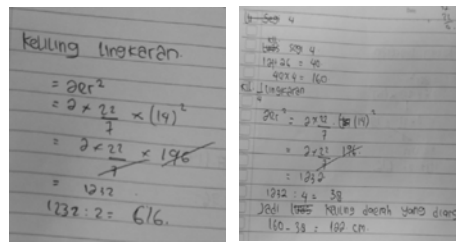


Figure 2: Students' answer sheet of mathematical connection ability which are low

Figure 2 shows the students' low mathematical connection ability because students are not able to understand the given problem form and can not connect: (1) concept with concept, that is the concept of circle diameter with the concept of the circle area, (2) the geometry material with the social arithmetic that is the concept The whole area of the wake-up that is shaded with the concept of wages to be paid by Ani bu to the gardeners and, (3) the connection ability by solving math problems with real life problems.

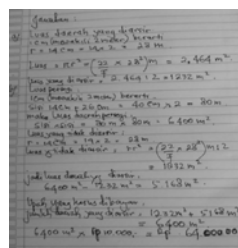


Figure 3: Students' answer sheet of mathematical connection ability which are high

Figure 3 shows the answer sheet of students' high mathematical connection ability because students can understand the problems so that, (1) the students can link the concept of radius with the concept of the circle area, (2) link the concept of the circle area with the area of the park Bu Ani, (3) students can associate the concept of mathematics with the concept of economics, (4) students can link the usefulness of mathematical concepts and economics to solve the problem. From the 25 students only 20% are able to solve the problem correctly, while the other students make many mistakes in solving the problem. Furthermore, based on the observation that students in solving mathematical problems do not try hard, it is seen there are students who just scribble paper answers with graffiti that has nothing to do with answers and not trying to find answers from examples in their study guide book, It is like Figure 4 below.



Figure 4: Students' answer sheet that show they didn't work hard in solving mathematical problem

Based on the facts above is an indicator of the low ability of mathematical connections and self-confidence of students by itself have an impact on the quality of mathematics learning. This is evident from the results of the 2015 [22] Program for International Student Assessment [22] that Indonesia's position is still concerning that Indonesia's score is 375 below the average of the Organization for Economic Cooperation and Development (OECD) score: 494 Furthermore, based on the results of the Third International Mathematics and Science Study (TIMSS) shows that the self-confidence of Indonesian students is still low at only 14% [29]. Such information reinforces the importance of the precision of the learning approach used for students to develop their potential. The above facts also show that the traditional approach does not support to develop the ability of mathematical connections and student self-confidence well. Relevant research is [11] the results of his research indicate that contextual learning approach gives a significant influence on the ability of mathematical connection and student self-confidence [18] the results of his research indicate that learning mathematics with contextual learning approach gives a significant influence on mathematical connections and there is no difference in mathematical connection ability between men and women [10] that there is an increase in the test results of mathematical connection of students with the application of contextual learning approach in learning Mathematics in the students of grade VII-2 SMP Nurhasanah Medan. Based on the above description there is a gap with the goal to be achieved with the reality that is in the field. We can also observe that the effect of the approach used in the learning process has a great influence on students' mathematical connection ability and self-confidence so that the learning process must actively involve the students. Given the components of a contextual learning approach, contextual learning approaches as an alternative can be used to train students in terms of mathematical connection capability and self-confidence in the learning of mathematics in the classroom. Based on the description that has been mentioned above, to describe whether the approach of contextual learning in learning mathematics gives a significant influence, the authors conducted a study with the title "The Influence of Contextual Learning Approach In Mathematics Learning To The Ability Of Mathematical Connection And Self-Confidence Student Class VIII SMP Negeri 8 Field".

1.2. Research method

This research is an experimental research with a quasi-experimental type of experiment. The population of the study were students of class VIII SMP N 8 Medan. From the selected class, two classes were taken randomly, one experimental class and one control class. The determination of the student level is based on the student's daily average score before the material to be tested. The test of mathematical connection ability consists of 5 description questions according to the indicators set forth by the National Council of Teachers of Mathematics [21], while the self-confidence, questionnaire consists of 30 items of statements with Likert scale. The mathematical connection ability test and the self-confidence questionnaire are given at the end of the learning in the experimental class as well as the control class.

The study of mathematical connection ability and self-confidence data presented here includes description, summary of hypothesis test results and data analysis based on learning, and analysis of the combined effect (interaction) between learning and KAM factors.

1. Mathematical Connection Ability Factor And Student Self-Confidence Factor

Table 1: Average score of mathematical connection ability based on learning factors

Learning	N	Mean	SD
Kontekstual	34	81,4118	7,88676
Ekspositori	34	74,9412	9,86866
Total	68	78,1765	12,82109

Table 2: Average score of Self-Confidence based on learning factors

Learning	N	Mean	SD
Kontekstual	34	80,2059	8,14
Ekspositori	34	76,3529	6,57
Total	68	78,2798	7,35

The result of difference test of Mathematical Connection Ability, Self-confidence and Intercation is done through two path Anova, the result is shown in Table 3 and Table 4 below.

Table 3: Mathematical Connection Ability, Mean Differences Test Result Based on Learning and mathematical early ability Factors

Sumber Varian	db	JK	RJK	F _o	F _{tabel (0,05)}	Sig
Antar (A)	1	505.03	505.03	F _{o(A)} = 9.35	3,146	0,003
Antar (B)	2	1889,34	944,67	F _{o(B)} = 17.49	3,996	0,000
Interaksi (AB)	2	18,06	9.03	F _{o(AB)} = 0.17	3,996	0,846
Dalam	62	3348,73	54.01	-	-	-
Total	67	5967,88	-	-	-	-

Based on Table 3 it can be concluded that: differences between A (Learning Approach A1 = Contextual and A2 = Ekspositori).

Because $F_o (A) = 9,35 > F_{tabel} = 3,146$ then H_o is rejected, it means there is difference of mean of mathematical connection ability of student which is taught by contextual learning approach with mean of mathematical connection ability of student which is taught with ekspositori learning approach.

Table 4: Average Self-Confidence Differential Test Results Based on Learning and Mathematical Early Ability Factors

Sumber Varian	db	JK	RJK	F _o	F _{tabel (0,05)}	Sig
Antar (A)	1	223.32	223.32	F _{o(A)} = 11,45	3,146	0,001
Antar (B)	2	2328.55	1164.27	F _{o(B)} = 59.67	3,996	0,000
Interaksi (AB)	2	74.96	37.48	F _{o(AB)} = 1.92	3,996	0,155
Dalam	62	1209,82	19.51	-	-	-
Total	67	3865.69	-	-	-	-

Based on Table 4 it can be concluded that: differences between A (Learning Approach A1 = Contextual and A2 = Ekspositori). Because $F_o (A) = 11,45 > F_{table} = 3,146$ then H_o is rejected, it means there is difference of mean self-confidence of students who are taught by contextual learning approach with mean self-confidence of students who are taught with ordinary learning approach. Based on Table 3, it is different to know which higher source variant between A (A1 = Contextual and A2 = Normal) is tested by Dunnett test [12] with the result to = $3,630 > t_{tab} = 1,669$ at the level Significant $\alpha = 0,05$ further according to Table 4 for Dunnett test-t statistic test, with $t_o = 3,596 > t_{tab} = 1,669$ at significant level $\alpha = 0,05$ then overall it is concluded that the mean of mathematical connection ability and student self-confidence Which is taught by contextual learning approach is greater than the average of mathematical connection ability and self-confidence of students who are taught by ordinary learning approach, meaning that the ability of mathematical connection and self-confidence of students who are taught by kontekstual learning approach is better than the ability of mathematical connection And self-confidence students are taught with ordinary learning approaches. In other words contextual learning approach gives a significant influence on the ability of mathematical connection and student self-confidence.

2. Interaction between Learning and Student Mathematical Precedence Factors Against Mathematical Connection Ability

Based on Table 3 it can be seen that for learning factor and Student Mathematical Precedence that is $F_o = 0,167 < F_{tabel} = 3,996$, with significant level 0,05 so concluded that there is no interaction factor of learning approach with factor of student's early mathematical ability to connection ability Mathematical students mean there is no joint influence between learning with students' early mathematical abilities. So the mathematical connection ability of the students is caused by the influence of the learning approach not because of the students' early math ability. The graph of the interaction can be seen in Figure 1 below.

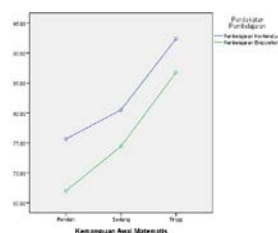


Figure 3: Comparison of Student Mathematical Connection Ability Based on Learning And

mathematical early ability

3. Interaction between Learning and mathematical early ability Factors Against Self-confidence

Based on Table 4 it can be seen that for learning factor and Student Mathematical Earning Capability that is $F_o = 1,92 < F_{table} = 3,996$, with significant level 0,05 so concluded that there is no interaction of learning approach factor with factor of student's early mathematical ability To the self-confidence of students means there is no joint influence between learning with students' early mathematical abilities. Relevant researches are [8],[28],[20], Tanda. So the self-confidence of students is due to the influence of the learning approach not because of the students' early math skills. The graph of the interaction can be seen in Figure 2 below.

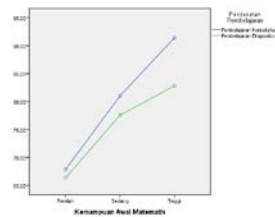


Figure 4: Comparison of Student Self-Confidence Based on Learning And mathematical early ability

1.3. Discussion

There is influence of contextual learning approach to mathematical connection ability and student self-confidence in learning caused by characteristic of contextual learning approach is a conception that helps teacher to link subject matter with real world situation and motivate student to make relationship between knowledge and its application in their life as member Family and society. Departing from this conception the learning outcomes will be more meaningful. The learning process takes place naturally in the form of student activities work and experience, not just transfer knowledge from teacher to student. This is in line with what Gage and Berliner [25] say: Knowledge may be received, accumulated, and active construction of meaning through his or her interactions with physical and social environments.

In contextual learning, students are encouraged to understand what learning means, what the benefits are and how to achieve them. They realize that what they learn is useful for their lives. Thus they will position themselves as a party that requires the provision of his life later. This is similar to what Fosnot says and dikutip by Suparno [25] that meaningful learning or meaningful learning takes place through reflection, solving conflicts of understanding, and in the process always renew the level of incomplete thought. Contextual learning is more related to the relationship between the material that students learn with practical use in everyday life. Awareness of the usefulness of mathematics in everyday life increases students' interest in learning mathematics and reduces the boredom of students while learning mathematical concepts. This is consistent with Ausubel's learning theory [25] is learning must be meaningful, the material being studied is assimilated in a non-arbitrator and related to the knowledge previously possessed. The same thing is said by Warsita [25] that the learning process is not just memorize concepts or facts but is an activity linking concepts to produce a complete understanding so that the concepts learned will be understood well and not easily forgotten

Application of concepts when students deal with problem solving activities during practice. Teachers motivate by providing relevant exercises or examples, cooperating. Working together in the context of sharing, responding, communicating with other students is a factor in developing student self-confidence, it is also consistently related to the emphasis on real life in contextual learning approaches. The transferring process of science (transferring) is as a strategy of using knowledge in a new context or a new situation that has not been resolved / resolved in the classroom. This is in line with research [12] research results show that contextual learning approaches have a significant effect on the ability of mathematical connections and student self-confidence. [20] that learning with a contextual learning approach gives a better influence on students' mathematical connection ability. This is similar to the article written by Michael Crawford, that learning with a contextual learning approach is a strategy to create a constructivism classroom, where this constructivism classroom has an influence on students' connection and self-confidence. [15] that the contextual learning approach is significantly better than ordinary learning in improving students' mathematical connection ability. Unlike the control group whose learning is done with the usual learning approach, ie without cooperative learning. Learning is done tends in one direction that is only centered on the teacher. The teacher explains then the students take notes and then the students answer the questions in the LAS. So from the data obtained looks the difference, although there are some students who understand the learning materials. This is because they learn to accept only what the teacher says without exploring further and not being actively involved, so that learning becomes dull, unattractive and unpleasant. Based on the above description, it shows that activities in the experimental class and control class show different mathematical and self-confidence connection capabilities, ie, mathematical connection ability and student self-confidence better than mathematical connection ability and self-confidence of students taught by Ordinary learning approach. Thus it can be interpreted that learning with contextual learning approach has a significant effect on the ability of mathematical connection and student self-confidence. The results of the analysis were carried out on the learning (contextual, ordinary) of early mathematical ability on mathematical connection ability and student self-confidence identifying that there was no interaction. This suggests that learning with contextual and learning approach with ordinary approach has an effect on mathematical connection ability and student self-confidence, whereas if it is connected with early ability of mathematics students have no influence in mathematical connection ability and student self-confidence. This indicates that the difference in the average ability of mathematical connections of students with high ability, medium and low who are given learning with contextual learning approach and ordinary learning approach there is no significant difference. However, if seen in the field during the learning process stages, high and moderate initial skills are more dominant and more benefited in this learning stages because students more easily understand the material being studied while the initial low ability of the students longer to understand the material. The advantage gained by a group of students with low ability who did not have the courage to ask the teacher. In this study, students have the courage to ask their partner and group about what they do not understand, so that each student with initial ability (high, medium and low) gets benefit by applying learning with contextual learning approach. In contrast to the control group ie without cooperative learning, so that each student with initial ability (high, medium and low) not all dare to ask the teacher or friends, because learning is not designed with group learning. After the learning with contextual learning approaches in the experimental class and the learning with the usual approach in the control class, it is obtained the score of mathematical connection ability of the students of the experimental class of the average value of 81,4118 standard deviation of

7.88676, for the control class the average rating is 74,9412 Standard deviation of 9.86866. Furthermore, the students' self-confidence in the experimental grade class is 80.21, and the standard deviation 8.14. Furthermore the results on the control class averaged 76.35, and standard deviation of 6.57. This indicates that learning with contextual approach is one means to develop self-confidence of students, because when students discuss is one of the applications of the learning community. In this learning society self-confidence students will develop, because one of the factors to develop self-confidence of students is to do social interaction to friends, teachers and ask each other.

1.4. Conclusions

Based on data analysis of research results and discussion can be drawn conclusion as berikut.

1. Associated with the ability of mathematical connections :

- a. Overall the mathematical connection ability of students taught by contextual learning approaches is better than the mathematical connection ability of students who are taught with ordinary learning approach. Meaning that contextual learning approach gives a significant influence on students' mathematical connection ability.
- b. There is no interaction between learning factors and again mathematical early ability st student mathematical connection ability

2. Relates to student self-confidence :

- a. Overall self-confidence students who are taught with contextual learning approaches are better than self-confidence students who are taught with ordinary learning approaches. Meaning that contextual learning approach gives a significant influence on students' mathematical connection ability.
- b. There is no interaction between learning factors and mathematical early ability against Self-Confidence students.

1.5. Recommendations

1. Based on the results of the study, learning with contextual learning approach applied to learning activities provides important things for improvement. For that researchers suggest some of the following. Learning with contextual learning approaches should be used as an alternative learning strategy for teachers in junior high schools, especially in improving the ability of mathematical connections and self-confidence students
2. For teachers or educators should create an atmosphere of learning that provides opportunities for students to interact among students in groups, fellow students in different groups and students with teachers in expressing ideas - gagasam mathematics with the language and their own way, so that in learning mathematics Students become daring to argue, more confident and creative
3. Learning with contextual learning approach can be used as an alternative in improving students' mathematical connection ability on the subject of the circle so that it can be used as input for the school to

be developed as an effective learning strategy for other mathematics subject.

4. But according there are some things that must be considered by teachers at the time of learning are:

- a. It takes a long time while the contextual learning process takes place
- b. If the teacher can not control the class then create a less conducive class situation.
- c. The number of students who are not happy when asked to cooperate with others, because students who diligently feel must work beyond other students in the group. Feeling worried about the loss of characteristics of students because they have to adjust to the group.

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