

The Effect of Application of the ARCS Learning Model on Motivation Learn Maths Students

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Abstract

This study aims to determine the students' motivation to learn mathematics by applying the ARCS learning model. This type of research is quantitative research, with an experimental approach. The research design used in this study is the Randomized Control Group Design. The sample in this study was class VII_A as the experimental class and class VII_B as the control class. Based on initial observations, it was found that students' learning motivation was still relatively low. Efforts to overcome these problems can be through the use of learning models that are in accordance with the characteristics of students' problems in this case applying the ARCS learning model (Attention, Relevance, Confidence, Satisfaction). The results showed that the data on the percentage of students' learning motivation questionnaires for each aspect in the control class, for students' Attention conditions to learning mathematics was 51.51%, students' Relevance conditions were 49.31% and for Confidence. Students in learning mathematics is 50.22% while student satisfaction in learning mathematics is 51.36%, so that the average score is 50.77%. The data obtained on the percentage of students' learning motivation questionnaires for each aspect in the experimental class, for the condition of students' Attention to learning mathematics by 72.38%, students' Relevance conditions of 75.47% and for Confidence students in learning Mathematics is 79.52% while students' satisfaction in learning mathematics is 77.30%. The average score of the experimental class is 75.90%. It can be concluded that the ARCS learning model (Attention, Relevance, Confidence, Satisfaction) can affect the mathematics learning motivation of class VII students with a comparison of the average score of students' mathematics learning motivation in the experimental class which is higher than the average score in the control class, which is 75.90 % > 50.77%.

Keywords : Learning Model, ARCS, Mathematics Learning Motivation

Introduction

Technological developments are very influential in the development of mathematics and affect the improvement of the quality of education. Mathematics is a science that is the stepping stone for the development of modern technology, mathematics has a very important role in various fields of science and the development of human thinking power. The field of information and communication technology which is developing very rapidly is also inseparable from the role of the development of mathematics. So, to be able to create and develop technology and survive in the future, an understanding and mastery of mathematics is needed from now on.

Understanding and mastery of mathematics can be obtained in the learning process.

Learning is a process that a person goes through so that a change occurs for the better, for example someone who does not know something will know, someone who does not understand will understand, and so on. Learning is a process carried out by individuals to achieve a change in aspects of their knowledge, skills and attitudes. Thus, it can be interpreted that individuals will experience changes when learning activities are carried out. In the learning process, there will be changes in student behavior in a positive direction. This behavior change includes aspects of

knowledge, understanding, skills and values (Hamalik 2016).

Learning is a process that involves physically or mentally through intense interaction with the environment which aims to obtain a change in aspects of knowledge, understanding, skills and attitude values. The change is constant and reactive. A person is said to be experiencing a learning process when there is an activity in him that results in a change in behavior. Learning is a process characterized by changes in a person. Changes as a result of the learning process are shown in various forms, such as changes in knowledge, understanding attitudes, behavior, skills and skills (Sudjana 2010).

One of the fields of science that can hone humans so that changes occur for the better is mathematics. Mathematics is a pattern of thinking, a pattern of organizing logical proof. Thus, it can be concluded that learning mathematics is a process that involves humans individually as a single organism so that changes in knowledge, skills and attitudes occur. This change covers aspects of knowledge, understanding, skills and values.

Mathematics learning in schools focuses students on understanding learning, so teachers are not only required to have broad insight, but are also required to be able to master and be able to practice good teaching techniques. The problem that occurs today is the low quality at every level of education. Various efforts and efforts have been made to improve the quality of education, including the attention of parents to their children.

In this case, to study the field of mathematics requires a strong push from within and from outside the student. This

drive in a person is called motivation. Someone who does something with enthusiasm, confidence and optimism are the characteristics of someone who has high motivation. In student learning activities as well, students who have a high enthusiasm for learning are characteristics of students who have high learning motivation, with high motivation in learning, they will obtain learning outcomes that will increase even more optimally.

Learning motivation is important and greatly affects student learning outcomes, so it is necessary for the teacher's role in fostering student enthusiasm for learning so that students feel happy in participating in the learning process. Student activities in class are closely related to motivation such as the movement of students to do something and want to produce something good, namely an effort for the purpose of learning, namely good mathematics learning outcomes. To foster motivation in the mathematics learning process of students at school, there are several ways that can be done, including giving rewards, prizes can be given if students succeed in answering the challenges given in the mathematics learning process in class, this is so that students are emotionally provoked to take part. processes or activities that take place during the learning process. Motivation will also arise because of the need, or desire for the goals to be achieved (Hamalik, 2016). There are various ways to generate student motivation, one of which is by showing students that the skills they learn are very necessary and useful for them both now and in the future (Usman, 2016).

Growing motivation in students by instilling understanding in students that it is important to position a task given by the teacher as a challenge so that students will make every effort. By risking self-esteem, this is one important way to increase student motivation. Student motivation has an important role in growing passion and enthusiasm for learning to achieve learning goals. Based on the explanation above, it can be concluded that motivation is a strong impulse from within a person, encouragement can be in the form of encouragement from outside or encouragement from within himself.

Motivation has a close relationship with the element of interest. Motivation in a person will arise because of a need, and so does interest, so it is appropriate that interest is the main motivational tool.

From the results of observations of the mathematics learning process that took place in class VII of SMP Negeri, when the learning process took place students tended to be passive and activities were dominated by the teacher. Students pay less attention to the teacher's explanation, it is very clear when the teacher asks questions, students cannot answer. Based on observations during the learning process when the teacher gave the subject matter in front of the class, most of the students were not enthusiastic in

participating in the learning process. Students are busy with their own activities and even ignore the teacher who is giving the subject matter.

The results of observations that show students' low motivation to learn mathematics are evidenced by the fact that many students are busy chatting with their classmates, there are students daydreaming, and it is very clear that students are not enthusiastic about participating in the mathematics learning process. So that in the exercise carried out the results showed that many students did not pass and did remedial. Based on the results of initial observations, students' motivation in learning mathematics in class VII SMP, can be seen in the table below :

Table 1. Students' Motivation and Activeness in Learning Mathematics in Class VII Semester 1

No	Class	Information
1	VII _A	13Students
2	VII _B	11 Students
3	VII _C	7 Students

Source: Preliminary Observation Results

nts are less motivated in learning mathematics The table above shows that stude due to the tendency of teachers to teach without using models that are able to make students motivated, in the learning process the teacher dominates the activities that occur so as to minimize student involvement in the learning process. In

order for these problems to be overcome, it is very necessary to have an effort or method that the teacher must implement in the learning process so that students' motivation to learn mathematics can increase. Efforts or ways to overcome these problems can be through the use of learning models that are in accordance with the characteristics of the problem, namely learning models that can increase students' motivation to learn mathematics. In this case the role of the teacher is very important to overcome these problems. For this reason, teachers are expected to be able to apply good and correct learning models and use the concepts of the subjects to be delivered. The low motivation of students to learn mathematics is suspected that the learning model used by the teacher does not support the increase in students' learning motivation. Teachers still use conventional learning models, where teachers dominate activities or activities that take place in the learning process. With the various problems that arise as above, so in this case it is necessary to apply a learning model that is expected to increase students' motivation to learn mathematics.

A learning model that is considered capable of making the learning atmosphere meaningful and interesting, as well as increasing student motivation and attracting students' attention to listen well

during the learning process is the ARCS (Attention, Relevance, Confidence, Satisfaction) learning model. ARCS is a learning model based on motivational principles, ARCS learning model is a learning model that prioritizes students' enthusiasm for learning throughout the learning process (Sulistiyani, 2011). A student's learning outcomes are influenced by learning motivation that affects learning outcomes, so by applying the ARCS learning model it is considered capable of being a bridge to determine whether or not there is an influence of learning motivation and student learning outcomes (Irsaf, 2014). This learning model was developed based on the theory of expected value. This ARCS learning model has advantages including providing instructions, presenting the material using interesting theories, student-centered learning processes, and being able to conduct in-depth evaluations of the abilities possessed by students. The steps in applying the ARCS learning model are (1) to cultivate students' recollection of the material that has been studied (A), (2) convey the objectives and benefits of learning (R), (3) explain the subject matter (R), (4) presenting concrete examples (A and R), (5) being a facilitator in the learning process (R), (6) involving students participating in learning (C and S), (7) providing positive feedback (S), (8) draw conclusions on the material that has been presented at the final stage of learning (S) (Sulistiyani, 2011).

The advantages of the ARCS learning model are (1) it provides instructions and directions on what students should do, (2) the material presented is not only theoretical but also attractively packaged, (3) the ongoing

learning process is student-centered, (4) in the application of the ARCS model, it aims to increase motivation by reflecting back on the material that has been previously given, (5) The assessment is carried out evenly to identify the abilities possessed by students according to the characteristics of the students themselves. With the advantages of the ARCS learning model (Attention, Relevance, Confidence, Satisfaction), it is very relevant to be used to see student learning motivation.

Related to the ARCS learning model (Attention, Relevance, Confidence, Satisfaction, Research conducted by Yulianti, Eka Murdani, and Intan Kusumawati (Yulianti, Murdani & Kusumawati, 2019) entitled "The Influence of the Application of Attention, Relevance, Confidence, Satisfaction Learning Models" ARCS) on Learning Motivation and Student Learning Outcomes on Heat Material in Class X ". This study aims to determine the motivation and learning outcomes of students by applying the ARCS learning model, in this study the material provided is limited to only material regarding heat. The results show that there are The difference in student learning motivation in the experimental and control classes is 5.88 which is in the high criteria. The difference in student learning outcomes in the experimental and control classes is 2.738 is in the high criteria. The influence of student learning motivation in the control class is obtained by a probability value of 0.029. The effect of student learning outcomes experimental class obtained the value of prob ability of 0.000. So it can be concluded that there is a significant effect on the application of the

ARCS learning model on learning motivation and student learning outcomes.

Research conducted by Intan Naumi Putri, Mochammad Ahied, Irsad Rosidi (Putri Ahied & Rosid, 2019) entitled "The Effect of the ARCS Learning Model (Attention, Relevance, Confidence, Satisfaction) on Self Esteem". The purpose of this study is to determine whether the ARCS learning model (Attention, Relevance, Confidence, Satisfaction) affects students' self-esteem. The research was carried out at MTs Al Muttaqun Kediri in the 2017/2018 academic year, in this study the researcher used 2 classes, namely the experimental class in this case namely class 8A and the control class, namely class 8C. The research design used is Quasi Experimental. The results showed that there was a significant influence on students' self-esteem that occurred in the control class and the experimental class, where the experimental class was the class that applied the ARCS learning model (Attention, Relevance, Confidence, Satisfaction) and the control class that used the conventional learning model. From the calculation, the data obtained proves – $t_{count} < t_{table}$ (-5.614 2.008 < 5.614. The results also show the quality of self-esteem of normal students with an average posttest of 68% experimental class.

Research conducted by Nurlinda Fitriani and Rufa Hera (Fitriani & Hera 2019) entitled "The Effect of the ARCS Learning Model (Attention, Relavance, Confidance, Satisfaction) on Increasing Student Activity and Learning Outcomes on Human Respiratory System Materials at SMP Negeri 5 Seunagan, Nagan Regency Kingdom". This study aims to determine whether the ARCS model (Attention,

Relevance, Confidence, Satisfaction) can increase student activity and learning outcomes on the human respiratory system material at SMP Negeri 5 Seunagan, Nagan Raya Regency. The type of research used is qualitative research where the research process is carried out by giving pre-test and post-test to the research sample. To obtain the results of the research, the researcher first determined the population in the study, namely all eighth grade students of SMP Negeri 5 Seunagan. Then the sample class was determined randomly because all the population was normally distributed, in this study there were 2 classes that became the sample class, namely class VIII-A which amounted to 18 people was designated as the experimental class and class VIII-B which amounted to 19 people was designated as the control class. The results showed that after the treatment, namely by applying the ARCS learning model, the student activities that occurred during the learning process in the experimental class were better than the control class, while in terms of student activity the results showed that the experimental class was higher than the control class and the average the average post-test value of the experimental class was 76.67 while the control class was 58.16. It can be concluded that the experimental class learning outcomes are higher than the control class learning outcomes. So from this research, learning the human respiratory system with the ARCS model can increase the activity and learning outcomes of class VIII students at SMP Negeri 5 Seunagan.

Research conducted by Syaripah (Syaripah, 2016) entitled "The Influence of Perception of Mathematics Learning on

Students' Learning Motivation in Mathematics in SMA N 1 CURUP Timur T.P 2015/2016". The purpose of this study is to determine whether there is a significant influence between the perception of learning mathematics on students' learning motivation in mathematics subjects, and in this study also wants to know what percentage of the influence of perceptions of mathematics learning on students' learning motivation in mathematics subjects in class X SMA N 1 Curup T.P 2015/2016. In this study, the research population was all students of class X at SMA N 1 Curup T.P 2015/2016 which amounted to 383 students. Meanwhile, the sample was 42 students from class X. The measuring instrument in this study was using a measuring instrument or an instrument in the form of a questionnaire. The questionnaire used is in the form of a statement that aims to see students' perceptions and motivations for learning mathematics in which the statement items consist of 15 questions. The results of the analysis of research data obtained the results of the perception score of mathematics learning with an average of 3.3183 and a standard deviation of 0.35553, while for students' learning motivation in mathematics, an average of 3.3671 was obtained and the standard deviation was 0.36021. The results of the analysis requirements show that both questionnaire results are normally distributed, so that the analysis requirements are met. The results of the hypothesis test show that there is an effect of the perception of learning mathematics on students' learning motivation in the field of mathematics with the acquisition of calculations of 0.992 or 99.2% where the remaining 0.8% is influenced by other

factors. Thus, it can be concluded that there is a significant effect of the perception of mathematics learning on students' learning motivation in mathematics at SMA N 1 Curup T.P 2015/2016.

Based on the relevant research above, it can be concluded the importance of research on the implementation of a learning model and students' motivation to learn mathematics. The studies above will be much different when compared to the research that the researchers did. The relevant studies above and the research that the researcher has done have something in common, namely wanting to see the effect of the ARCS learning model (Attention, Relevance, Confidence, Satisfaction), but there are also many differences, namely the relevant research above wants to see the effect of implementing the ARCS model (Attention, Relevance, Confidence, Satisfaction) on self-esteem, motivation and learning outcomes. It will be much different from the research that the researchers did. Researchers will conduct research to determine the effect of ARCS (Attention, Relevance, Confidence, Satisfaction) on students' mathematics learning motivation. The sample, population and time and place of the research were carried out at different times and places.

Methods

This research used quantitative research, while the research approach used was experimental. Quantitative research with an experimental approach is carried out to test a research hypothesis that is used to have a causal relationship between two variables. The purpose of experimental research is to identify and

present what happens when certain research variables are controlled or manipulated in a certain way. Experimental research by looking at feedback from two or more variables by giving treatment to the sample group. Because the researchers used two independent variables, namely by using the ARCS learning model and those not using the cooperative learning model, the research model used was "Randomized Control Group Design".

The population is the entire research subject (Suharsimi Arikunto, 2006). So the population in this study were all students of class VII SMP, there were 2 classes, namely class VIIA, VIIB. In accordance with the type of research, the sample required is 2 classes where one is the control class and the other is the experimental class, what the author does in determining the sample class is to take mid-semester test scores in the field of mathematics study for class VII odd semesters and carry out the normality test (Sudjana, 2013), homogeneity test and the average similarity test to these values with the results obtained that the data is normally distributed, homogeneous and the average similarity is the same, so to get a sample the author can use a random sampling technique so that the class is obtained VIIA as the experimental class and the second paper obtained by class VIIB as the control class.

Variables in a study consist of independent variables where what is meant by independent variables are variables that result in changes or occurrence of other variables or often called dependent variables. In this study, the independent variable is the mathematics learning model using the ARCS (Attention, Relevance,

Confidence, Satisfaction) model, while the dependent variable is the variable generated by the independent variable, in this study the dependent variable is and learning motivation. student mathematics.

The technique used in this study used an instrument in the form of a questionnaire. Questionnaire is one of the research instruments, in this study the researcher used a questionnaire to collect research data presented in the form of several written statements to the research sample or respondents to provide answers.

Table 2. Experimental Research Design

No.	Class	Treatment	Test
1.	Experiment	X ₁	T
2.	Contol	X ₂	T

Results and Discussion

This research was conducted in class VII SMP Negeri in the odd semester. Where this study uses two classes where one class is used as a control class, namely class VIIA and the other class is used as an experimental class, namely class VIIB by applying the ARCS (Attention, Relevance, Confidence, Satisfaction) learning model to the operation material in algebraic form. Here the researcher will look at the students' motivation to learn mathematics in the control class and in the experimental class. The data on the percentage of students' learning motivation questionnaires were analyzed by calculating the percentage of the assessment scores in the control class and the experimental class on students' mathematics learning motivation.

The data on the percentage of students' learning motivation questionnaires for each aspect in the control class, for the condition of students' Attention (attention) to learning mathematics is 51.51%, students'

Relevance (Relevance) conditions of 49.31% and for Confidance (Self Confidence) students in learning mathematics by 50.22% while the students' satisfaction in learning mathematics is 51.36%. The following is the percentage of students' learning motivation for each aspect in the control class, namely the class without using the ARCS learning model (Attention, Relevance, Confidence, Satisfaction).

Table 3: The results of the Student Motivation Questionnaire taught by the Ordinary Learning Model

Aspect	Percentage	Criteria
Attention	51,51%	Low
Relevance	49,31%	Low
Confidance	50,22%	Low
Satisfaction	51,36%	Low

For the acquisition of students' learning motivation scores without using the ARCS (Attention, Relevance, Confidence, Satisfaction) learning model in class VIIA SMP.

The data on the percentage of students' learning motivation questionnaires for each aspect in the experimental class, for students' Attention (attention) conditions for learning mathematics is 72.38%, students' Relevance conditions are 75.47% and for Confidance (Self Confidence) students in learning mathematics of 79.52% while student satisfaction (satisfaction) in learning mathematics is 77.30%. The following is the percentage of students' learning motivation for each aspect in the experimental class, namely the class that received the ARCS (Attention, Relevance, Confidence, Satisfaction) learning model.

Table 4: The results of the Student Motivation Questionnaire taught by the ARCS learning model (Attention, Relevance, Confidence, Satisfaction)

Aspect	Percentage	Criteria
Attention	72,38%	High
Relevance	75,47%	High
Confidance	79,52%	High
Satisfaction	77,30%	High

To obtain a student's learning motivation score without using the ARCS (Attention, Relevance, Confidence, Satisfaction) learning model in class VIIIB of SMP.

The results of the data processing of the control class and the experimental class used in this study aimed to see the ARCS learning model (Attention, Relevance, Confidence, Satisfaction) has an influence on the motivation to learn mathematics in class VII SMP. Obtained $t_{count} > t_{table}$ where $t_{count} = 19.3307$ and $t_{table} = 1.6838$ at a significant level of 0.05 with degrees of freedom (dk) $n-1$.

Table 5: Percentage and Criteria for the Development of Students' Mathematics Learning Motivation Based on Aspects of the Motivation Questionnaire

Aspect	Control Class		Experiment Class		Information
	%	Criteria	%	Criteria	
Attention	51,51	Low	72,38	High	Increase
Relavance	49,31	Low	75,47	High	Increase
Confidance	50,22	Low	79,52	High	Increase
Satisfaction	51,36	Low	77,30	High	Increase

The table above shows the results of the students' mathematics learning motivation scores in each aspect increasing. It can be concluded that using the ARCS learning model (Attention, Relevance, Confidence, Satisfaction) can affect students' motivation to learn mathematics than without using the ARCS learning model (Attention, Relevance, Confidence, Satisfaction).

The initial step taken by the researcher before the start of the treatment in the study was that the researcher made preliminary observations aimed at identifying students' motivation to learn mathematics, from the results of initial observations what could be found was that there were still many students who were classified as low motivated in participating in the mathematics learning process.

In the preparation stage, the researcher chose 2 classes to be the sample class,

namely the control class and the experimental class. Because the sample was normally distributed, the researcher determined the class randomly so that class VIIA was obtained as the control class by applying the ordinary learning model and class VIIIB as the experimental class by applying the ARCS learning model.

In the preliminary activity stage the researcher determines the learning strategy that will be used in this case the researcher prepares a control class that will use this ordinary learning model, namely the learning steps that are often used in the previous learning process at school, namely where in the learning process the activities that occur the teacher's activities dominate so it is very visible student activity in following the learning process so that student motivation in learning mathematics is very low.

In the experimental class, the researcher implemented the ARCS (Attention, Relevance, Confidence, Satisfaction) learning model. The ARCS learning model had an important component in it, namely the values and goals to be achieved. From these two components, Keller described them into four components. The four components of the learning model are Attention, Relevance, Confidence, and Satisfaction. The ARCS learning model is specifically designed to see students' learning motivation, the components in this learning model are classified according to the activities that occur in learning.

In the Core Activities, after the application of the learning model was applied to each sample class, the researcher gave a questionnaire, where this questionnaire aimed to measure how much enthusiasm the students had in learning mathematics.

From the results of the questionnaire, it was found that the enthusiasm for learning mathematics in the class that applied the usual learning model or the control class, namely class VII A SMP, obtained an average score of 50.77% with a standard deviation of 3.99. The average score of students' mathematics learning motivation in junior high school is still in the low percentage range. This happens because the steps in the learning process used are still dominated by the teacher, so the space for students to develop is very limited. So an update is needed, namely by applying a learning model that can attract students to be enthusiastic in participating in the mathematics learning process. The learning model that is considered capable of influencing students' mathematics learning motivation is the ARCS (Attention, Relevance, Confidence, Satisfaction) learning model. In the experimental class, namely the class that uses the ARCS learning model, namely class VII B, the average score of the experimental class is 75.90% with a standard deviation of 4.52. The average score of students' motivation to learn mathematics is high.

Thus, it can be concluded that the ARCS learning model (Attention, Relevance, Confidence, Satisfaction) can affect the mathematics learning motivation of seventh grade junior high school students with a comparison of the average score of students' mathematics learning motivation in the experimental class which is higher than the average score in the control class, namely $75.90\% > 50.77\%$.

Conclusion

From the results of the study, it can be concluded that the class that uses the ordinary learning model, the average score

of students' motivation to learn mathematics in class VIIA SMP Negeri is 50.77 which is in the low category with an average deviation of 3.99. (2) Classes using the ARCS (Attention, Relevance, Confidence, Satisfaction) learning model, the average score of students' mathematics learning motivation in class VIIB SMP Negeri is 75.90 in the high category with an average deviation of 4.52. (3) There is an effect of using the ARCS learning model (Attention, Relevance, Confidence, Satisfaction) on the motivation to learn mathematics

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