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THE EFFECT OF CONTEXTUAL TEACHING AND LEARNING (CTL) MODEL WITH THE ASSISTANCE OF SNAKE AND LADDER MEDIA ON STUDENT PHYSICS LEARNING OUTCOMES

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Abstract :
This research was conducted to know the effect of applying the CTL learning model assisted by snakes and ladders media on student learning outcomes. This research is experimental research with a pretest-posttest control group design. The population in this study were all MIPA Putri MA students in Pamekasan, while the sample consisted of two groups, namely the experimental class and the control class, with a purposive sampling technique. The experimental class and control class samples each consisted of 30 students. The experimental class was given the CTL model learning treatment with the help of ladder snakes, while the control class was given the Discovery Learning (DL) model. The instrument used in this study was an instrument to test students' physics learning outcomes in the C1-C4 cognitive domain in the form of multiple-choice questions. Data collection is done through tests. Data analysis used the Ancova test with the pretest results as the control variable. The results showed that the significance value obtained was <0.001 (<0.05), meaning that the CTL model assisted by snakes and ladders media significantly affects student learning outcomes.

Keywords: CTL-Model; Learning Model; Snake Ladder Media

INTRODUCTION

Education is something that has a very important role to improve Human Resources (HR). Education includes the Natural Sciences (IPA). Science learning, especially physics, is expected to be able to prepare human resources who are able to compete in the global era through the implementation of learning that is not only the process of receiving information. Because, science is not just mastery of a collection of knowledge in the form of facts, concepts, or principles. But it is also a discovery process from the results of the investigation (Content Standards Agency [BSI], 2006). In the discovery process, science is closely related to everyday life. So that science learning is not only for mastering a number of knowledge, but also must provide sufficient space for the growth and development of scientific attitudes, practicing problem-solving processes, and their application in life, (Wiyono & Budhi, 2018).

The reality that occurs in the field is that many students feel that physics is difficult and boring. Physics is known as a subject which only contains formulas and is considered to have nothing to do with everyday life. Even physics tends to be a less desirable subject. These conditions make students feel

bored and less serious in participating in the learning process and have an impact on students' interest in learning and the low physics learning outcomes of students.

Student learning outcomes are a better level of mental development when compared to before learning. Interests and student learning outcomes are two things that are related and can be influenced by various factors, one of which is all things related to the learning process both students who feel bored or bored while studying and the learning model used by the teacher when teaching. So it is necessary to use innovative learning models that are fun for students and make students interested in participating in the learning process. In addition, a learning model is also needed that does not only emphasize the teacher as a source of information but learning that learns from events in the environment around students. One learning model that is proven to improve students' mastery of concepts is the Contextual Teaching Learning (CTL) model. This model uses a contextual approach or real-life events with the material being studied (Suprianto, Kholida, & Andi, 2016). The CTL learning model can provide an interesting atmosphere in the learning process. the advantages of the CTL learning model are student-centered learning, students are more active in class, teachers become facilitators and can still monitor students, (Dewi & Primayana, 2019).

The characteristics of the learning process using CTL, namely: 1) The learning process in CTL is a process of understanding the knowledge students have learned into complete knowledge that is related to one another. 2) Learning to acquire and add new knowledge obtained by deductive way. 3) learning in the context of understanding knowledge so students don't just memorize theory. 4) Learning in order to practice the knowledge and experience gained by students. 5) Learning for knowledge development (Fadillah et al., 2017). The application of the CTL model in the learning process has proven effective in increasing student motivation in class (Hapizoh et al., 2020; Yulia & Ningsih, 2018). The CTL model is also proven to be able to improve students' mastery of concepts (Huda, Hikmawati, & Kosim, 2019). Likewise with learning outcomes, this model is proven to increase student learning outcomes in various subjects such as physics, biology, mathematics, (Permatasari, Jamzuri, & Wahyuningsih, 2013), (Rahmawati, Wahyuningsih, & Dua Getan, 2019), (Suprianto, Kholida, & Andi, 2016).

In addition to the learning model innovations that will be used, teachers can also innovate in the use of learning media to simplify or make the learning process more interesting. One of the media that can be used is the game of snakes and ladders. Snakes and ladders media is a game for children drawn in the form of snakes and ladders connecting several small squares. This game can be played by 2 or more people (Nugroho, Raharjo, & Wahyuningsih, 2013). This snake and ladder media can be used as a fun learning medium for students. So that students will be interested in participating in the learning process, especially learning physics, (Firman & Maisyarah, 2019).

To overcome the conditions described above, interesting learning innovations are needed. Therefore, in this study the CTL learning model with the help of snakes and ladders media was applied to students' physics learning outcomes. Collaborative use of the CTL model with the help of snakes and ladders media has been used previously, especially for physics subjects to determine students' mastery of concepts.

RESEARCH METHOD

This research is experimental research with a pretest-posttest control group design. This research will be carried out on June 8, 2022, in MA. Miftahul Ulum Bettet Pamekasan in the 2021-2022 academic year in the even semester. The population in this study was class X-XII MIPA Putri MA Miftahul Ulum Bettet Pamekasan. While the sample consisted of two groups, namely class XB as the experimental class and class XC as the control class, with the sampling technique using a purposive sampling technique. The experimental class and control class samples each consisted of 30 students.

The research design used a pretest-posttest control group design. The experimental class was given the Contextual Teaching and Learning (CTL) learning model assisted by snakes and ladders media while the control class used the Discovery Learning (DL) learning model. Both of these sample groups were given a pretest before treatment and a posttest after treatment.

The data is quantitative data. The instrument used in this research is the test instrument. The test instrument is in the form of 15 multiple-choice questions and fulfills several cognitive domains of learning outcomes, namely: remembering (C1), understanding (C2), applying (C3), and analyzing (C4).

Before being used as an instrument, the questions were tested for validity by Ali. The test was carried out by distributing test sheets to students to find out student learning outcomes in the cognitive domain before and after being given treatment in both the experimental class and the control class.

Data analysis was carried out by testing the hypothesis using the ANCOVA test. Prior to testing the hypothesis, it was first tested for normality using Shapiro Wilk and homogeneity test of variance, linearity test and the significance of the regression direction, and homogeneity test of the regression coefficient.

RESULTS AND DISCUSSION

Data on learning outcomes was obtained from the pretest and posttest results from the control group and the experimental group. The description of student learning outcomes data in the control class and experimental class is shown in Table 1. The average value of the experimental class was 85.53 and that of the control class was 70.00. From these data it can be seen that the average value of the experimental class is higher than the control class.

Table 1. Data Description

Descriptive Statistics			
Dependent Variable: Posttest			
Kelas	Mean	Std.Deviation	N
Eksperimen	83.53	9.551	30
Kontrol	70.00	8.906	30
Total	76.77	11.419	60

The results of the residual normality test for the research data are shown in table 2. The normality test was not carried out on each variable but on the residual value (regression analysis). This value shows significance for learning achievement data > 0.05, this means that the residual learning outcomes are normally distributed.

Table 2. Summary of Residue Normality Test

Tests of Normality			
Dependent Variable: Posttest			
Residual for posttest	Shapiro-Wilk Statistic	Df	Sig.
	.985	60	.670

The results of the variant homogeneity test are shown in table 3. The significance obtained in the Levene's Test was 0.670 (> 0.05), this indicates that the variance of the two groups is the same or homogeneous.

Table 3. Summary of Variance Homogeneity Test

Levene's Test of Equality of Error Variancesa			
Dependent Variable: Posttest			
F	df1	df2	Sig.
.487	1	58	.488

The results of the linearity test of the dependent variable (pretest-posttest) are shown in Figure 1. This figure shows a tendency for a straight line pattern (linear), this means that there is a significant linear relationship between the pretest and posttest in both the control class and the control class.

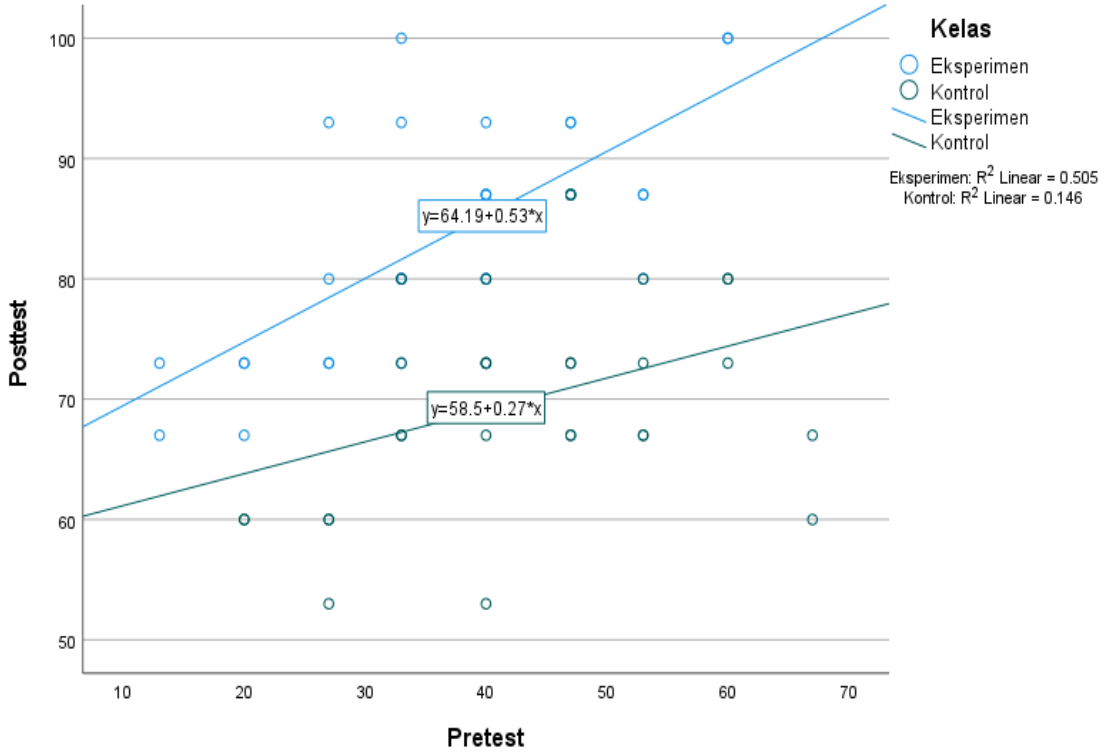

Figure 1. Graph of the Linearity Test of the Covariate-Dependent Variable

The results of the regression coefficient homogeneity test are shown in table 4. The significance in the class*pretest column was 0.098 (> 0.05), this indicated that the regression coefficients of the two treatment groups were the same or homogeneous.

Table 4. Summary of Regression Coefficient Homogeneity Test

Tests of Between-Subjects Effects				
Dependent Variable: Posttest				
Source	Type III Sum of Squares	df	Mean Square	F
Kelas	43.713	1	43.713	.748
Pretest	1506.897	1	1506.897	25.783
Kelas*Pretest	165.652	1	58.445	2.834

With the fulfillment of the prerequisite assumptions of the Ancova test, then a hypothesis test is carried out using the Ancova test and as shown in the table. 5. Obtained a significance value in the pretest of <0.001 (<0.05), this indicates that there is a significant effect of the pretest value on the posttest value of learning outcomes. While the significance value for the class (treatment) is <0.001 (<0.05), this indicates that there is a significant difference between the class (treatment) on the posttest score. In this way it can be concluded that there is a significant effect of the CTL model assisted by snakes and ladders media on learning outcomes.

Table 5. ANCOVA Hypothesis Test Results

Dependent Variable: Posttest					
Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Pretest	1506.897	1	1506.897	24.979	<,001
Kelas	3677.328	1	3677.328	60.958	<.001

This research was conducted to determine the effect of the contextual teching and learning model with the help of snakes and ladders media on student learning outcomes between the experimental

class and the control class. While the experimental class in the study was students of class X IPA-B MA. Miftahul Ulum Bettet and students of class X IPA-C MA. Miftahul Ulum Bettet as a control class. The difference in the treatment given between the experimental class and the control class lies in the use of the learning model. In the experimental class, the CTL model was applied with the help of snakes and ladders media, while in the control class, the DL model was applied. The results showed that the contextual teaching and learning (CTL) learning model with the help of snakes and ladders learning media applied to the experimental class had a significant influence on student learning outcomes. This can be seen from the results of hypothesis testing using the Ancova test obtained a significance value in the pretest of <0.001 (<0.05), this indicates that there is a significant effect of the pretest value on the posttest score of learning outcomes. While the significance value for the class (treatment) is <0.001 (<0.05), this indicates that there is a significant difference between the class (treatment) on the posttest score.

Learning outcomes are students' abilities obtained after participating in learning activities in the cognitive domain which include C1-C4, namely: remembering (C1), understanding (C2), applying (C3) and analyzing (C4). Learning outcomes are the ultimate goal of carrying out learning activities in schools. The achievement of learning objectives is the end result of the influence in the learning process and the achievement of these learning objectives based on the curriculum can be seen from the increase in student learning outcomes, (Yulinar, Tandililing, & Mahmuda).

However, in the field, many students find it difficult and bored when learning, especially for physics material. As an effect, students assume that physics lessons are subjects that only contain formulas and have nothing to do with everyday life and affect the low student learning outcomes. To avoid things like that, innovation is needed in the learning process such as the use of learning models that are more attractive to students so as to make students active in learning. One suitable learning model is the contextual learning model (Contextual Teaching and Learning/CTL). CTL is learning that relates real world situations to learning material so that it can make students more easily understand the material (Bern & Erickson, 2001). The CTL model is very effectively applied in the physics learning process because it can train students to find concepts more easily, (Yuwandra & Arnawa, 2020). Students also tend to be more interested in the learning process because they feel that the material they are studying is not abstract (Wildani, Budiyono, & Zaitun, 2021).

In addition, the existence of learning media can also help students be more active in learning, so that data students practice using their ability to remember and memorize to solve problems. This is in accordance with the results of research by Sandi (2016) which revealed that the existence of learning media, namely the snake and ladder game, students can learn while playing, so that students can practice using their ability to remember and memorize understanding concepts to solve problems, and can create a pleasant atmosphere in the process. learn how to teach. Students more easily understand physics concepts when learning models are applied in class using a contextual approach and using snakes and ladders media. This is also in line with the results of research conducted by (Firman & Maisyarah, 2019) which states that physics learning media using snakes and ladders games can increase student motivation and learning outcomes.

CONCLUSION

The Contextual Teaching and Learning (CTL) model with the help of snakes and ladders media has a significant effect on student learning outcomes with a significance value for calculating the Ancova hypothesis test of <0.001 (<0.05). So the use of the CTL model and snakes and ladders media is recommended for use in the learning process.

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