THE EFFECT OF CONTEXTUAL TEACHING AND LEARNING (CTL) MODEL ON BIOLOGY LEARNING OUTCOMES OF BACTERIA CONCEPTS IN CLASS X STUDENTS OF MA ALIYAH ALHILAL NAMLEA)

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Article Info

Contextual teaching and learning (CTL) learning model on learning outcomes of bacterial concepts in Class X MA Aliyah alhilal namlea Students This type of research is a Quasi Experiment research that aims to determine the effect of Contextual Teaching and Learning (CTL) learning model on biology learning outcomes of bacterial concepts in class X MA Aliayah Alhilal Namlea students. The sample in this study amounted to 22 students selected using random sampling technique. The data collection technique used was a test consisting of 30 items of multiple choice questions pretest and posttest with data processing techniques normality test, homogeneity test and hypothesis testing using SPSS (Statistical Product and Service Solutions) version 25. The results showed that there was a positive and significant effect of the Contextual Teaching and Learning learning model on the learning outcomes of the biology of the concept of bacteria in class X MA Aliyah alhilal Namlea students. This can be seen from the total percentage obtained before being given treatment in the excellent, good, sufficient and deficient categories, namely 0% and after being given treatment in the posttest experimental class reached 82% in the excellent category, in the good category 9.09% in the sufficient category 4.54% in the deficient category reached 4.54. The results of the normality test for the experimental class with a Sig level of 0188 while for the control class 0.200%. The results of the experimental class homogeneity test with Sig level pretest 0.352 and posttest 0354. In hypothesis testing using the t test with a significant value of 0.00 <0.05, it is known that the t value is 9.909 and the t table is 1.72472, it can be assumed that the effect of the CTL learning model affects student learning outcomes.

Keywords: Contextual Teaching and Leaning, Learning Model (CTL), Learning Outcomes

1.   Introduction

Learning has a very dominant role to realize the quality, both the process and graduates of education. The learning process also has an influence that can cause the quality of education to be low. This means that learning is very dependent on the teacher's ability to carry out or package the learning process. Not all teachers have the ability to deliver learning materials to students. As a result, learning is done as long as it goes, as long as the material is delivered and as long as the material runs out, the question of whether students understand the material or not gets less attention from the teacher.

In the learning process the teacher plays a very important role as a processor of learner activities, the teacher is also expected to assist and guide students in processing the subject matter. The 2013 curriculum demands the attitudes and competencies of students in learning and the relationship between the theories learned by students and the environmental conditions faced. The curriculum demands the active role of students in cognitive, psychomotor and affective aspects.

In general, good teaching models have properties or characteristics that can be recognized in general. Having a systematic procedure, learning outcomes are specifically determined, setting a specific environment, income size, interaction with the environment, while the functions of learning models are guidelines, curriculum development, determining teaching materials, helping improvements in teaching (Nasir, Wagino & Pasaribu, 2017). The learning model can be interpreted

as a conceptual framework that describes systematic procedures in organizing learning experiences to achieve specific learning objectives and serves as a guide for learning designers and teachers to plan and implement learning activities (Ibrahim, 2017).

Contextual learning or Contextual Teaching and Learning (CTL) is a learning activity that conveys material by linking it to the real daily life of students. Contextual learning is a learning approach that links the material learned with the real life of everyday students, both in the family, school, community and citizen environment with the aim of finding the meaning of the material for their lives (Komalasari, 2017).

The CTL learning model is learning that uses real context as a starting point for learning so that it provides meaning for the content of the material and meaning for the learner. It is clear that the context or real situation related to the material is the main key to the CTL learning strategy. The essence of the CTL approach is the connection of each material or learning topic with real life (Rusman, 2018).

The learning process in the classroom shows that teachers have not been able to create conditions and situations that allow students to carry out the thinking process. This can be seen from the activities of teachers and students during learning activities, where the teacher explains what has been prepared and provides routine and procedural exercise questions. Learners only record or copy and tend to memorize concepts and understanding of virus material that is in the book or explained by the teacher, so that the ability of students to understand concepts in respiration material is not optimal, where to understand respiration material requires a more complex thinking process using high reasoning power in responding to the information they receive.

From the student's side, learning outcomes are a better level of mental development when compared to before learning. The level of mental development is manifested in the types of cognitive, affective and psychomotor domains. Meanwhile, from the teacher's side, learning outcomes are the completion of learning materials (Sumartono & Normalina, 2015).

This is a contributing factor to the low learning outcomes of students in biology learning activities. The Contextual Teaching and Learning (CTL) learning model is considered appropriate when applied to respiration material because students can understand the process of respiration infection in humans. In addition, the use of the Contextual Teaching and Learning (CTL) learning model is also felt to help students to think about a concept, where someone who has the ability to think will provide the right direction in thinking and working and help in determining the relationship between one with another more accurately. Therefore, thinking skills are needed in problem solving / solution finding and the investigation process. Learning respiration material is learning that teaches students to learn concepts specifically such as concepts contained in an object and phenomena that occur in the environment. The formulation of the problem in this study are (1) How is the Effect of Contextual Teaching and Learning (CTL) Learning Model on Biology Learning Outcomes of the Concept of bacteria) (2) How much influence does the contextual Teaching and Learning (CTL) learning model have on the Biology Learning Outcomes of the concept of bacteria on Biology Learning Outcomes of the concept of bacteria on Class X Aliyah Alhilal Namlea Students. The objectives in this study are (1) To determine the effect of Contextual Teaching and Learning (CTL) Learning Model on Biology Learning Outcomes of bacterial concepts in Class X Aliyah Alhilal Namlea Students. (2) To determine how much the effect of Contextual Teaching and Learning (CTL) Learning Model on Biology Learning Outcomes of bacteria in Class X Aliyah Alhilal Namlea Students.

2.　　Methode

This type of research is experimental research using a quasi-experimental design in which there is 1 class, namely the experimental group and the control class. Before being given the material each class is given an initial test, then after that the Contextual Teaching and Learning learning model is applied to one of the groups and then given a final test to each group. The data collection techniques

used are Test and Non-test. While the Data Analysis Technique this data analysis is carried out after the data from the instrument sample is completely collected. The data analysis techniques used in this study are descriptive analysis techniques and inferential analysis.

3. Results and Discussion
Descriptive Statistical Analysis

Descriptive statistical analysis using the help of the SPSS Version For 25.0 application. The learning outcomes of class X students of MA Aliyah Alhilal Namlea are as follows:

a. Descriptive Learning Outcomes in the Experiment Class

Based on the learning outcomes obtained by class X MA Aliyah Alhilal Namlea students as an experimental class totaling 22 students, the following student learning outcomes were obtained:

Table 1 Statistical Analysis of Student Learning Outcome Scores in Experimental Classes
Experiment Pre-test and Post-test

Statistic	Pretest	Posttest
Jumlah siswa	22	22
Nilai maks	70	100
Nilai min	21	60
Rata rata	95.59091	84.909

Source of primary data processed 2023

Based on table 3.1 above, it can be seen that the pretest and posttest scores on class X MA Alyah bacterial material with a total of 22 students as an experimental group, obtained pretest data with an average value of 95.59091 and on the posttest after applying the Contextual Teaching and Learning learning model obtained an average value of 84.909.

Furthermore, frequency and percentage distribution data are presented which aims to facilitate reading the number of students in the class who reach the completeness of learning outcomes with certain intervals. The frequency distribution and percentage of groups can be seen in the table as follows:

Tabel 2 Frequency and Percentage Distribution of Biology Learning Outcomes
Experiment Class

Interval	pretest		postets		Kategori
	frek	Persentase(%)	frek	Persentase(%)	
78-85	0	0	18	82%	Sangat baik
70-77	1	4.54	2	9.09	Baik
62-69	3	13.63	1	4.54	Cukup
54-61	18	82	1	4.54	kurang

Source of primary data processed 2023

Based on table 3.2, the learning outcomes of the experimental class before the application of the Contextual Teaching and Learning learning model in the pretest obtained a percentage of 100% of students who did not reach the KKM score. After applying the Contextual Teaching and Learning learning model and being given a posttest, a percentage of 21% of students who did not reach the KKM score was obtained. In the 78-85 value interval, 82% of students were obtained, while for the 70-77 category there were 9.09% with a frequency of 2 students. in the 62-69 category there were 4.54% and in the 54-61 category there were 4.54% with a category of 1 student. from these results it

can be seen that before the application of the Contextual Teaching and Learning learning model (pretest) and after the application of the Contextual Teaching and Learning learning model (posttest) there was a change, namely an increase in the value of the biology learning outcomes of the concept of bacteria.

b. Descriptive Learning Outcomes of Control Class

Based on the learning outcomes obtained by class X MA aliyah alhilal students as a control class totaling 22 students, the following student learning outcomes were obtained:

Table 3 Statistical Analysis of Student Learning Outcome Scores Control Pre-test and Post-test

Statistic	Pretest	Posttest
Jumlah siswa	22	22
Nilai maks	64.00	97.00
Nilai min	14.00	73.00
Rata rata	37.272	83.59

Source of primary data processed 2023

Based on the table above, it can be seen that the pretest and posttest scores on bacterial material in class X MA Aliyah Alhilal Namlea with 22 students as a control class, obtained pretest data with an average value of 37.27 and on the posttest without applying the Contextual Teaching and Learning learning model obtained an average value of 83.59. Furthermore, frequency distribution data and percentages are presented which aim to facilitate reading the number of students in the class who reach the completeness of learning outcomes with certain intervals. The frequency distribution and percentage of the control class can be seen in the table as follows:

Table 4. Frequency and Percentage Distribution of Learning Outcomes Control Class Biology

Interval	pretest		postets		Kategori
	frek	Persentase(%)	frek	Persentase(%)	
75-85	0	0	18	82%	Sangat baik
70-77	0	0	4	18.18%	Baik
62-69	1	4.54%	0	0	Cukup
54-61	21	95.4	0	0	kurang

Source of primary data processed 2023

Based on the learning outcomes of the control class before the application of the Contextual Teaching and Learning learning model in the pretest, a percentage of 100% of students did not reach the KKM score. After the application of the Contextual Teaching and Learning learning model and given a posttest, a percentage of 21 students who did not reach the KKM score was obtained. In the very good category obtained as much as 82% with a frequency of 18 students, while for the good category there are 4 students with a percentage of 18.18%. in the sufficient category is at a percentage of 0% and in the category of less there are 0 students. from these results it can be seen that before the application of the Contextual Teaching and Learning learning model (pretest) and after the application of the Contextual Teaching and Learning learning model (posttest) there is a change, namely an increase in the value of the learning outcomes of the biology of the concept of bacteria Furthermore, the learning outcomes of the biology of the concept of bacteria based on completeness after treatment, can be seen in the following table:

Tabel 5 Deskripsi Ketuntasan Hasil Belajar Biologi Siswa Kelas Kontrol dan Kelas Eksperimen

Nilai	Kategori	Kelompok eksp		Kelompok kontrol	
		Frek pre-test	Frek pos-test	Frek pre-test	Frek pos-test
>65	Tuntas	82%	82%	0	82%
<65	Tidak tuntas	95.45%	9.09%	94.45%	0%
	Jumlah	22	22	22	22

Source of primary data processed 2023

Based on table 3.5 above, it can be concluded that the results of the completeness of biology learning on bacterial material given treatment, namely the experimental class and those not given treatment, namely the control class, have almost the same results. In the experimental class pretest, all students were not complete, while in the experimental class posttest there were 18 students who reached completeness with a percentage of 82%. While incomplete for prites there were 95.45% and postest9.09%. The control class on the pretest can be seen that all students are not complete, while on the posttest there are 82% of students who reach minimum completeness.

Inferential Statistical Analysis

Inferential statistical analysis is data analysis used to determine the extent of similarity between the results obtained from a sample and the results that will be obtained in the population as a whole. The results of inferential statistical analysis aim to answer the existing hypothesis. In this study, the hypothesis to be seen is whether there is an influence after the application of the Contextual Teaching and Learning learning model on biology learning outcomes on bacterial material. Before testing the hypothesis, the normality test and homogeneity test were carried out first.

a. Normality Test

The normality test in this study used the Sapiro-Wilk test on the SPSS for Windows Release 25 software. This normality test is used to determine whether the data is normally distributed or not. The SPSS program analysis has a sig level of $\alpha = 0.05$, which is> α then the data is said to be normal, while if the data < α then the data is said to be abnormal. For more details, consider the following normality test table:

Table 6 Normality Test

No	Kelas	Pretes	postest
1	Kelas kontrol	200	200
2	Kelas eksperiment	188	188

Source of primary data processed 2023

Based on the normality test data table using the SPSS version 25.0 program above, the class with the conventional learning model, namely the control class, is 200 and the experimental class by applying the Contextual Teaching and Learning learning model, namely the experimental class on bacterial material, is 188, this shows that the data from each student is normally distributed, this can be seen from the significant value (p)> 0.05.

b. Homogeneity Test

The homogeneity test is used to determine whether there is a similarity between several variable variants. If the sig value> 0.05 then it can be said that the variants of the two variables are the same, if the sig value < 0.05 then the variants of the two variables are not the same. For more details, consider the following homogeneity test table:

Table 7 Homogeneity Test Results

Statistic	Postets		pretest	
	Kls eks	Kls kontrol	Kls eks	Kls kontrol
Sig	0.354		0.352	
Taraf sig	0.05		0.05	
Kesimpulan	Kedua data homogen		Kedua data homogen	

Source of primary data processed 2023

Based on the table of homogeneity test results above, it can be concluded that there is a similarity of the two test variables where it can be seen that the post-test data of the control class and the experimental class shows 0.0354 greater than the alpha level of 0.05, meaning that the two data are homogeneous. as well as the pretest in the Kontron class where the significance level is greater than 0.352 from alpha 0.05, meaning that the data is homogeneous.

c. Hypothesis Testing

Based on prerequisite analysis testing, data on learning outcomes taught using the Contextual Teaching and Learning learning model are declared normally distributed and homogeneous.

1.Hypothesis Test

Table 8. T-test of the hypothesis of the effect of the ctl learning model

Variabel	T hitung	T tabel	A	sig
The effect of ctl learning model	9.099	1.72472	0.05	0.000

Source: IBM SPSS stastic data

From the results of the t-test calculation (partial) shows that the significance value of the effect of the ctl learning model ((X) on learning outcomes (Y) is (0.000) <a (0.05). Hypothesis testing in this study, namely for the t-test, is carried out, if the H0 hypothesis is rejected and Ha is accepted, which means that there is an effect of the ctl learning model on learning outcomes. The results of the calculation of t count are obtained from the help of the SPSS program using the coefficient table and the t table results are obtained using the formula:

t= (a/2:n-k-1
 = (0.05/2): (30-1-1)
 = (0.025:20)
1.72472

This means that there is a difference in the ability of Biology learning outcomes by using the Contextual Teaching and Learning learning model. So, the use of Contextual Teaching and Learning learning model is proven effective in learning biology in class X MA Aliyah Alhilal Namlea students. Based on the t value, it is known that t count = 9.099 and t table value = 1.72472 so it can be concluded that the hypothesis test results produce a significant value that is smaller than the α value, which is 0.000 <0.05. These results prove that H1 is accepted, which means that there is an effect of the Contextual Teaching and Learning learning model on the learning outcomes of Biology of the concept of bacteria in class X MA Aliyah Alhilal Namlea.

4.   Conclusions

Based on the results of research and discussion, it can be concluded that: The influence of the Contextual Teaching and Learning (CTL) learning model has an influence on student learning outcomes where there is an increase in the learning outcomes of class X MA Aliyah Alhilal Namlea students on Bacteria material which can be seen in the descriptive data results which show that in the experimental class applied Contextual Teaching and Learning (CTL) learning model is higher with an average of 95.59091% than the control class which is not applied Contextual Teaching and Learning (CTL) learning model with an average value of 37.272%. The learning outcomes of the experimental

class and control class obtained Sig (2-tailed) value is $0.000 < 0.05$. Thus it can be concluded that there is a significant difference in effectiveness (real) between the use of the Contextual Teaching and Learning (CTL) learning model and conventional methods to improve students' Biology learning outcomes on the concept of bacteria in class X MA Aliyah Alhilal Namlea.

Reference

[1] Ibrahim, R dan Nada Syaodih S. *Perencanaan Pengajaran*.Jakarta : Rineka Cipta, 2010.

[2] Kasmawati. *Pengaruh Model Pembelajaran Contextual Teaching and Learning (CTL) Terhadap Hasil Belajar*. Jurnal Pendidikan Fisika. Vol (5). No (1). ISSN : 2355-5785, 2017.

[3] Komalasari, Kokom. *Pembelajaran Kontekstual*: konsep dan aplikasi. Bandung, 2017.

[4] Nasir, Wagino & Pasaribu. *Metode Penelitian*. Bogor : Ghalia Indonesia, 2017.

[5] Rusman. *Model-model Pembelajaran*. Depok : Raja Grafindo, 2018.

[6] Sugiono. Metode Penelitian Pendidikan (Pendekatan Kuantitatif, Kualitatif, dan R&D). Bandung .Alfabeta, 2019.

[7] Sumartono dan Normalina. Motivasi dan Hasil Belajar Siswa dalam Pembelajaran Matematika dengan Menggunakan Model Pembelajaran Kooperatif Tipe Scramble di SMP", Edu MAT Jurnal Pendidikan Matematika, Volume 3, Nomor 1, April: 84-91, 2015.

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