



RESEARCH ARTICLE

The Influence of Contextual Teaching Learning Audio Visual Media Learning Models on Student Learning Outcomes on Digestive System Material in Class XI Private High School Pab 8 Saentis Medan

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Abstract

The background to this research is that the learning implemented by teachers has not provided optimal learning results on the digestive system material. This research aims to test the influence of the Contextual Teaching And Learning (CTL) learning model with audio visual media on the learning outcomes of digestive system material in class XI students at PAB8 Saentis Medan Private High School. The specific aim of this research is to test the differences in learning outcomes on digestive system material between the experimental class which applies the CTL model and the control class and to test whether there is an influence on student learning outcomes in the experimental class using the CTL model. The research method used is the experimental method. The design in this research is a quasi experimental design with a non-equivalent control group design. The population in this study was class XI IPA 3 as the experimental class and XI IPA 4 as the control class. The dependent variable in this research is the learning outcomes in the digestive system material and the independent variable is the CTL learning model. The technique for collecting data on learning outcomes uses multiple choice tests. The research results show that: (1) there are differences in learning outcomes in the experimental class and the control class as shown by the results of the independent samples T-test significance (2-tailed) = $0.036 < 0.05$. (2) there is an influence on the learning outcomes of experimental class students who use the CTL model with an average posttest score of 81, which previously was only 69.29. The suggestion is that the CTL learning model with audio visual media should be used as an alternative learning process on digestive system material in schools because it has a positive effect and is applied by teachers to create active learning.

Keywords

CTL; Learning outcomes; Significance

INTRODUCTION

Education is all life situations that influence individual growth as a learning experience that takes place in all environments and throughout life. Education aims to help someone learn various things they don't know yet in order to develop their potential. The active learning process is essentially an interaction process between teachers and students which contains student activities through various interactions and learning experiences experienced by both of them (Elaine, 2017).

Biology education is part of formal education material that is able to contribute to quality human resources. Mastery of biology through theoretical learning is largely determined by students' abilities and creativity in mastering science process skills. Students who have good processing skills will also have good academic achievement (Sulthon, 2016). Learning achievement is the result that has been achieved by students in carrying out teaching and learning activities both individually and in groups. Good learning achievement is influenced by several factors both within the student and other factors outside the student.

The learning model used must be able to foster student learning outcomes, especially in the digestive system material. In this material, the digestive system is a process that occurs in the human body as a way

to enter and receive food, digest it into energy and nutrients in the body and excrete the process through the anus. Therefore, it is very necessary to have a learning model that is appropriate to the digestive system material so that students can be more active. One example of a learning model that can foster students' activeness and learning achievement is the audio visual media contextual teaching learning model. This audio visual media contextual teaching learning model is a learning model that uses pictures or videos which will help students understand the learning process so that it is easier for students to understand. These images are the main factor in the learning process. So before the learning process the teacher has prepared images that will be displayed either in the form of a visual video or in the form of a story. Therefore, researchers feel that there is a need for learning media assistance in this case, namely pictures of the digestive system or simple digestive system videos to support the CTL learning model.

METHODS

A. Type and Research Design

1. Type of Research

This type of research is quantitative research with an experimental type of research. This research is a type of quasi-experimental design research (quasi-experimental) by conducting experiments on classes or experimental groups. Each experimental group was subjected to certain treatments.

2. Research Design

This research consists of 2 classes, namely the control class and the experimental class. The control class learns using methods commonly used by subject teachers at school, while the experimental class learns using the contextual teaching and learning (CTL) learning model with audio visual media. This research design uses a Nonequivalent Control Group, namely in this design the experimental and control groups are not chosen randomly (Sugiyono, 2007). With a nonequivalent control group design, researchers aim to find the effect of certain treatments on others under controlled conditions. The design form can be seen in Figure 1 as follows.

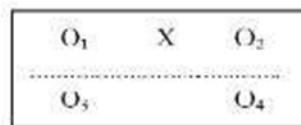


Figure 1. Research Design

Information :

X: The treatment given (the implementation of the learning process for the experimental group using the CTL Audia Visual model and the control class

O1-O2: pretest and posttest for experimental class O2-O4: pretest and posttest for control class

O2-O4: pretest and posttest control class

The nonequivalent control group design involves two classes, namely the experimental class and the control class. Group O1 (experimental group) was given treatment (X), namely by using a contextual teaching and learning model with the help of audio visual learning media, while group O3 (control group) was not given treatment (using regular learning) both groups were given a pretest to determine the initial condition of the two groups. The experimental and control groups meet the requirements to be used as research subjects if the pretest results between the two groups are not significantly different (O1=O3). After the experimental group was given treatment, the experimental group was given a posttest to determine the effect of the treatment that had been given. Posttest was also given to the control group. The results of the posttest in the control group were used as a comparison for the impact of the treatment given to the experimental group.

3. Time and Place

This research was carried out by researchers in July, 2021-2022 academic year. The research location will be carried out in class XI of PAB 8 Saentis Private High School, Medan.

B. Research Procedures

The research procedure includes three stages, namely:

1. Research preparation

2. Implementation of research, which is carried out in experimental classes and control classes in accordance with the learning implementation plan (RPP) that has been made by the researcher

3. Final Stage of Research

The steps in the final stage of research are as follows:

- Analysis of research data
- Conduct discussions, draw conclusions and suggestions
- Prepare comprehensive research reports
- Compile scientific articles resulting from research.

C. Population and Research Sample

1. Population

The population in this study were all students of class Science 3 and class XI Science 4.

2. Sample

Sampling in this research was carried out using purposive sampling, namely a sampling technique based on characteristics that have been determined by the researcher or commonly referred to as purposive sampling. Purposive sampling is used if the target sample being studied has certain characteristics so that it is impossible to take another sample that does not meet the specified characteristics.

D. Research Variables

The variables in this research consist of dependent variables and independent variables.

E. Data Collection Techniques

In collecting data in this research, researchers used several data collection techniques, including observation, tests, and documentation.

F. Research Instruments

In this research, the variable to be measured is student learning outcomes. The instrument used in this research is multiple choice test questions which are used to assess student learning outcomes. What will later be compared is the level of learning outcomes of students in the experimental class and the control class. Researchers also prepared research instruments and prepared learning equipment which included syllabus, lesson plans and question grids.

G. Data Analysis Techniques

The data analysis techniques used in this research are descriptive statistics and inferential statistics.

RESULTS

A. Trial of Research Instruments

The research used a quasi-experiment using two classes carried out at PAB 8 Saentis Medan Private High School using 2 class samples, Class XI Science 3 as the experimental class and Class XI Science 4 as the control class. The class used as an experiment uses the Contextual and Learning audio visual media learning model, while the class used as a control class uses a learning model that is always used by biology teachers at PAB 8 Saentis Private High School, especially class XI Science. The research was conducted to determine the mastery of concepts in students, especially class XI Science in biology subjects on the digestive system.

This research data was obtained through a posttest. The test used is multiple choice with a total of 25 questions. However, before researchers conduct posttest research, researchers must conduct a pretest first in order to determine whether the basic abilities of students in the experimental class and control class are homogeneous or not. Data processing in the test completely used the Microsoft Office Excel 2007 program and the SPSS version 20 program. The results of the research were obtained through data analysis of pretest test results from the experimental class using the (CTL) method and the control class using regular learning media which is usually used by teachers from class XI IPA. This pretest test was carried out to determine students' basic abilities before being given treatment, namely the CTL method assisted by audiovisual, and to find out whether the two classes were normal and homogeneous or not using Microsoft Excel and SPSS 20. The following are the student learning results from the pretest and posttest scores in the class experiments and classes in Table 1. and the graph in Figure 2. as follows.

Table 1. List of Pretest and Posttest Scores in the Experimental Class

KELAS EKSPERIMEN (CTL) XI IPA 3			
No	Nama	Nilai	
		<i>Pretest</i>	<i>Posttest</i>
1	Anisa Fitria	75	96
2	Anugraini	80	87
3	Dea Puspita Kesuma Wardani	68	70
4	Desy Surianti	70	86
5	Devina sari	76	96
6	Dhea Aura	76	70
7	Dimas prayoga	70	76
8	Dianvi BR sembiring	68	60
9	Dinda Juniar	60	85
10	Dwi Novita Sari	80	90
11	Erick Safrian	60	87
12	Eva elisa	80	60
13	Fatimah Azzahra	68	77
14	Karina Putri	68	100
15	Maya Lestari	76	75
16	Mayang Sari	78	100
17	Mega Elisa	50	80
18	Mhd. Fajar Iwanda	67	60
19	Mhd. Prayogi	50	65
20	Muhammad Ridho Pratama	74	70
21	Nursakinah Handayani	76	65
22	Putri Handayani	65	67
23	Rahma Diani	66	96
24	Reza Pratama	76	79
25	Rico Audiyansah	50	98
26	Rindu Erika Purba	72	89
27	Sekar Ayu	76	88
28	Susi Sundari	65	96
Jumlah		1940	2268
Rata-Rata		69.2857	81
Nilai Maximum		80	100
Nilai Minimum		50	60

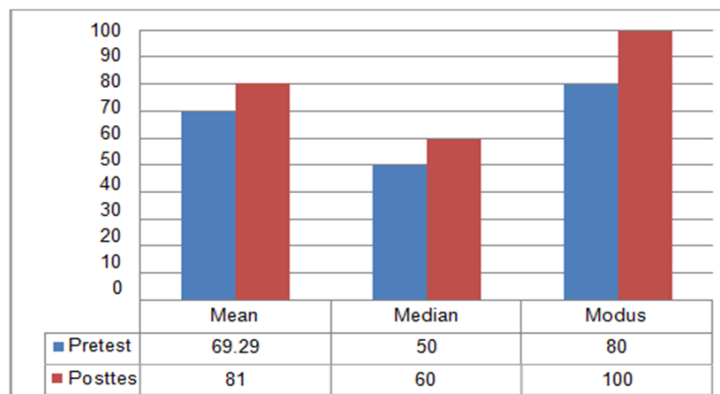


Figure 2. Graph of Mean, Median and Mode of Experimental Class

Based on the table above, it is found that the initial student learning results (pretest) from students in class -average 69.29 with median 50 and mode 80. So it can be concluded that student learning outcomes increased 16.90%.

Table 2. List of Pretest and Posttest Scores in the Control Class

KELAS KONTROL XI IPA 4			
No	Nama	Nilai	
		Pretest	Posttest
1	Adinda Edri Annisa	80	78
2	Aribi Febri Anggrilia	68	68
3	Armansyah Pane	70	50
4	Ayu Azhari	76	60
5	Diana Wulandari	76	90
6	Dini Dwi Lestari	70	94
7	Dwi Rama Andini	68	70
8	Feri Ardiansyah Batu Bara	60	68
9	Fira Andinni	80	56
10	Giska Anggun Pratiwi	60	78
11	Khairul Dwi Satrio	80	87
12	Maria BR Maharaja	68	76
13	Muhammad Radit Aditia	68	70
14	Muhammad Reza Febriansyah	76	88
15	Muhammad Yusuf	78	87
16	Nabila Dwi Anggini	50	86
17	Nadila Larasati	67	92
18	Nadila Anggraini	50	74
19	Ria Saputri	74	72
20	Ririn Alfiqi Purba	76	50
21	Siska Ayu	65	66
22	Siti Nurcahyani Munthe	66	68
23	Sri Rahayu A.	76	60

24	Suci Rama Sari	50	70
25	Uci Cahyani	72	78
26	Vadly Al Pauzar	76	76
27	Trio Ahmad Andika	65	68
28	Widya Asti	70	80
29	Zainda Anggerey	74	82
jumlah		2009	2142
Rata-Rata		69.2759	73.8621
Nilai Maximum		80	92
Nilai Minimum		50	50

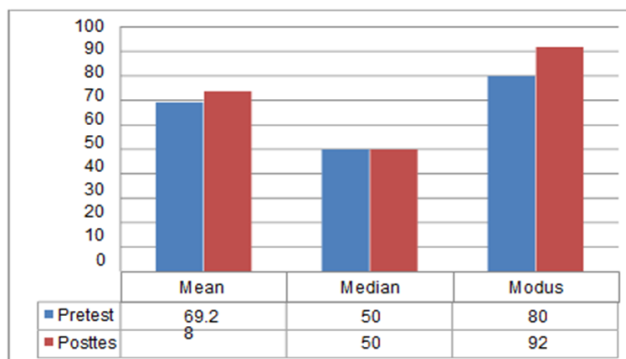


Figure 3. Graph of Mean, Median and Mode of Control Class

Based on the table above, it is found that the initial student learning results (pretest) from students in class -average 73.86 with median 50 and mode 92. So it can be concluded that student learning outcomes increased 6.61%. For more details, the graph of the comparison results of the control class and experimental class can be seen in Figure 4 as follows.

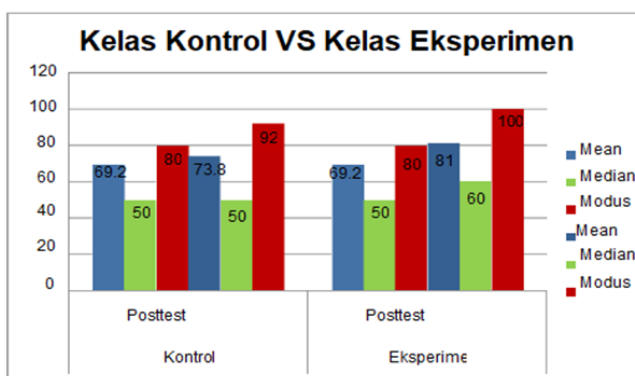


Figure 4. Comparison graph of the control class and the experimental class

From graph 4.3, you can see the results of the comparison between the control class and the experimental class where the experimental class experienced a significant jump in scores compared to the control class, this was because the experimental class implemented a learning process using CTL while the control class used a cooperative/regular learning process in its learning process.

B. Test Requirements Analysis

1. Population Data Normality Test Results

The pretest research data normality test was carried out as a test requirement to determine the research sample in the sense that the research data was normally distributed or not. Normal data is an absolute requirement before researchers carry out parametric statistical analysis (paired sample T-test and independent sample T-test). The normality test used in this research is Kolmogorov Smirnov with the help of the SPSS version 20 program. The significance value used in this research is 0.05. The criteria for testing normality are if the significance is <0.05 , then the experimental group data variance is not normal, conversely if the significance is >0.05 , then the data group variance is normal. The results of the pretest data normality test from class XI IPA 3 as the experimental class and class XI IPA 4 as the control class with the help of the SPSS version 20 program are presented in table 3 as follows.

Table 3. Pretest Data Normality Test Results

Tests of Normality

	Kelas	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	Df	Sig.	Statistic	Df	Sig.
Hasil Uji Pretest	Pretest Eksperimen (CTL)	.135	28	.200*	.884	28	.005
	Pretest Kontrol (reguler)	.138	29	.167	.887	29	.005

*. This is a lower bound of the true significance.

a. Test distribution is Normal

Based on table 4, it is known that the significance value of the data from the 2 classes in the sig column. > 0.05 , it can be concluded that the pretest score data from the 2 classes is normally distributed.

2. Test the Homogeneity of Population Data

The homogeneity test is used to determine whether there are similar variants in a population/group. The data homogeneity test used in this research is One Way Anova with the help of the SPSS version 20 program. The homogeneity test criteria used are if the significance is <0.05 , then the variance of the data groups is not the same or not homogeneous. Conversely, if significance is > 0.05 , then the variance of the data group is the same or homogeneous. The results of the population data homogeneity test using SPSS version 20 are presented in table 4 as follows:

Table 4. Results of Population Data Homogeneity Test

Test of Homogeneity of Variances

Pretest test results

Levene Statistic	df1	df2	Sig.
.029	1	55	.866

Sources processed by researchers

Based on table 4, it is known that the significance value of the experimental class and control class research population before the treatment was implemented was 0.866. These results show a sig value > 0.05 so it can be concluded that the variance of the pretest data from the experimental class and the control class is the same (homogeneous). Complete calculations in attachment 7.

The results of the normality test and homogeneity of pre-test scores were used by researchers to determine the research sample from the population at PAB 8 Saentis Medan Private High School. The research results were obtained through data analysis using descriptive statistics and inferential statistics.

3. Descriptive Statistical Analysis

Descriptive statistical analysis was carried out using SPSS version 20. Descriptive statistical analysis was carried out to determine the average value of individual learning outcomes and the average value of student learning outcomes. Descriptive value of individual student learning outcomes pretest and

posttest experimental class (CTL) and control class (regular). Based on the results of tests carried out on experimental class (CTL) and control class (regular) students, it can be seen in table 5 below:

Table 5. Descriptive statistical data on student learning outcomes

Descriptive Statistics

Hasil belajar siswa	Siswa	Minimum	Maximum	Rata-rata	Std. Deviation
Pretest Eksperimen	28	50	80	69.29	8.823
PostTest Eksperimen	28	60	100	81.00	13.185
Pretest Kontrol	29	50	80	69.28	8.643
Posttest Kontrol	29	50	92	73.86	11.864
Valid N (listwise)	28				

Based on descriptive statistical data on individual student learning outcomes pretest and posttest for the experimental class (CTL) and control class (regular) which can be seen in table 5, it is known that the sample in the experimental class (CTL) was 28 students and the lowest posttest score was 60. The highest posttest score was 100. Meanwhile, the control (regular) class sample was 28 students and the lowest posttest score was 50, the highest posttest score was 94, there were differences in each posttest score between the two classes. And the conclusion obtained is that there is an influence on learning outcomes using the contextual teaching learning (CTL) learning method which improves student learning outcomes compared to using the regular learning method usually applied by teachers in that class.

4. Inferential Statistical Analysis

Inferential statistics is data analysis used to determine the extent of similarity between the results obtained from a sample and the results that would be obtained in the population as a whole. Analysis of this data is by testing the posttest scores after receiving treatment where the experimental class uses the contextual teaching and learning (CTL) method and the control class uses the regular method that teachers usually use to teach in class XI Science.

DISCUSSION

Based on the research results, class XI IPA 3 as an experimental class (CTL) and class XI 4 as a control class (regular) have insignificant differences in the learning outcomes of different students. The differences between these two learning models are in accordance with the data analysis that researchers have carried out at PAB 8 Saentis Medan Private High School, especially in classes XI Science 3 and 4. Each experimental group/class was given certain treatment, both experimental and control classes. Students in the experimental class are taught using the contextual teaching and learning audio visual media learning model, which involves students actively relating the learning material to their daily lives. This is because students work together with their groups or individually to search for and exchange information in observing various learning media sources and making reflections on what they have learned so that students help each other and understand learning and make connections between the knowledge they have and its application in their lives as members. family and society. Students in the control class were taught using the regular methods that teachers usually apply in that class, such as lecture methods and short explanations. Previously, both classes were given a posttest which aimed to determine the basic abilities of each class and determine the population to be tested which functioned to determine the types of abilities of the two classes of the same type or homogeneous. After that, the researcher gave treatment to both classes to test and find out the results of this experiment whether there was a difference in student learning outcomes or not. After giving the implementation using the contextual teaching and learning learning model, audio visual and regular media in the sense of learning that teachers often use in the class, they were then given posttest questions to find out the final condition of ability after the two classes were given different treatment.

The posttest results obtained showed that the average score obtained by the experimental class (CTL) was 81, while the average score obtained by the control (regular) class was 73.86. This shows that the increase in student learning outcomes in the experimental class (CTL) is higher compared to the learning model in the control (regular) class.

1. Pretest Results for Experimental and Control Classes

It is known that the average pretest score in the experimental class is 69.28, while the average pretest score in the control class is 69.27. Before giving treatment to both classes, the researcher controlled the variables controlled in this research, namely the number of meetings, media and learning materials. The number of meetings for the experimental class and control class must be the same, learning is carried out in four meetings.

Based on the results of pretest data analysis for the experimental class and control class, it shows that the average pretest score is almost the same, this is proven by the homogeneity test, which obtained a sig of 0.866 more than 0.05 ($0.866 > 0.05$), so it can be concluded that there is no difference. significant average of both classes. Based on the results of the analysis of pretest scores in the experimental class and control class, students' understanding of the material tested was the same. In selecting the sample, researchers looked for SMA PAB 8 Saentis Medan with classes with the same number of students or at least close to the same (homogeneous). After finding that the sample was homogeneous in terms of ability and population size, then the two classes were given treatment to test the hypothesis that the researcher determined, namely to see whether there were differences in learning outcomes.

2. Posttest Results for Experimental and Control Classes

The results of the posttest scores are used to see student learning outcomes after being given treatment in both classes to test research hypotheses. Before testing the hypothesis using the Independent T-test, the researcher first tested the normality and homogeneity of the posttest values. The results of the normality and UI homogeneity tests show that the posttest scores have a normal and homogeneous distribution. Next, test the hypothesis using the Independent T-test to answer the hypothesis that the researcher wrote. The results of the Independent T-test show that the sig (2-tailed) is 0.036, less than the criterion value of sig 0.05 ($0.036 < 0.05$) so that H_0 is rejected and H_a is accepted. So there are differences in learning outcomes from the digestive system sub-material between the experimental class (CTL) and the control (regular) class.

The differences that occurred in the two samples were caused by the different treatments given to each class, namely the experimental class and the control class. In the experimental class, the CTL learning model was treated, while in the control class, regular learning was used by the teacher in that class. CTL learning using audiovisual media makes it easier for students to understand concepts and facts in understanding the digestive system material concretely by linking the knowledge students already have by providing materials, either reading or broadcasts, that are in accordance with the knowledge they have. Students' good understanding of the material influences students' cognitive domain. The cognitive domain is related to intellectual learning outcomes which consist of six aspects, namely knowledge or memory, understanding, application, analysis, synthesis and evaluation (Nana. 2009). So that learning that applies CTL with audio visual learning media and regular learning results in differences in learning outcomes regarding the digestive system material. Based on data analysis, the research results show that the sig value is $0.038 < 0.05$ so that H_0 is rejected and H_a is accepted. This means that there are differences in learning outcomes taught using the CTL model and the conventional model. This research looked at the results of the same significance as the researchers did, so that in this research H_0 was rejected and H_a was accepted because the significance value was smaller than sig 0.05. So there are differences in learning outcomes taught using the CTL model and the regular model that teachers usually apply in that class.

This difference is due to CTL learning which has 7 learning components, namely constructivism, discovery, questioning, learning community, modeling, reflection and actual assessment as well as learning that is assisted by the use of appropriate learning media, so that students are facilitated in searching, processing and discovering their own learning. concrete through students' activities in searching, trying and experiencing for themselves.

CONCLUSION

Based on the results of the research and discussion, it can be concluded that the Contextual Teaching And Learning (CTL) model of audio visual learning media has an influence on Biology learning outcomes in the digestive system sub-material of class XI Science students at PAB 8 Saentis Medan Private High School. The influence on learning outcomes is marked by the differences in learning outcomes in the experimental class and the control class. There are differences in Biology learning outcomes in the digestive system sub-material between the experimental class which applies the Contextual Teaching And Learning (CTL) learning model with audio visual media compared to the control class. Based on the results of the T-test using the independent samples T-test, the hypothesis shows that the sig value (2-tailed) = 0.036 ($0.036 < 0.05$), so according to the basis for decision making in the independent samples T-test, the average is There is a significant difference in the value of student learning outcomes in the experimental class and the control class, this shows that H_0 is rejected and H_a is accepted. Based on these conclusions, the Contextual Teaching And Learning (CTL) learning model with audio visual media influences learning outcomes in the digestive system material for class XI IPA students at PAB 8 Saentis Medan Private High School.

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