

# The Comparison of Students' Learning Outcome between Class with E-Learning and Conventional Class

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**Abstract**— This study aims to determine the comparison of students' learning outcomes between class using e learning and conventional classes that do not use e Learning in the learning process. This research is experimental research, because researchers conducted a treatment of learning in the experimental classes so that it had an effect on student learning outcomes. Furthermore, the student learning outcomes of the experimental classes were compared with the learning outcomes of the control classes that were not given special treatment in their learning process. To see the magnitude of the comparison of the learning outcomes of these two classes, the normalized gain test is carried out. Based on the normalized gain test it can be concluded that learning using e learning can improve student learning outcomes.

**Keywords**—student learning outcomes; e learning class; conventional class

## I. INTRODUCTION

Education is a very decisive thing in determining the direction of the nation's future development. Therefore, the quality of education must be guaranteed so that the nation going forward the quality of our education is not low. Law on National Education Law Indonesian Republic No.20 Year 2003 Chapter 1 Article 1 [1] states that:

“Education is a conscious and planned effort to create a learning atmosphere and learning process so that students actively develop their potential to have religious spiritual strength, self-control, personality, intelligence, noble character, and skills needed by themselves, society, nation and country.”

Based on the law, education is stated as a conscious and planned business, so education is an effort that should really be well prepared consciously so that future education produces a brilliant generation. The good and bad results of education can be seen from various types of indications, one of which is the value of student learning outcomes [1]. Learning outcomes are changes in students both cognitive and affective (behavior) after learning [2] [3] [4] [5].

Serious efforts to improve learning outcomes so as to have a greater impact on the world of education should indeed be done [6] [7] [8] [9]. One form of effort in improving educational outcomes is an effort to find an accurate formulation in conducting the teaching and learning process through research [10] [11]. In this study the authors conducted

research related to the comparison of learning outcomes with the aim of knowing how much the level of difference.

Based on the results of the study it was found that the students in the experimental class scored the highest 99, the lowest score was 44, and the average score was 78. While the students in the control class got the highest 91, the lowest score was 32, and the average score was 67.

## II. METHODOLOGY

This research is an experimental study, the researcher conducted a treatment of learning in the experimental class. The population of this study were all students at the Universitas Negeri Padang (a state university) in the odd semester of 2018. Samples were taken using the purposive sampling method, so that 2 samples were selected namely the class with section code 201811270465 as the experimental class and class 201811270392 as the control class. In the experimental class, the researcher gave treatment by applying learning using e learning, which was complete with material, pre test, post test, discussion forum, mid semester exam, and semester exams which were presented online. Whereas in the learning control class applied in a conventional way, namely by lecture method and classical discussion.

Data collection was carried out by means of documentation study of mid semester student learning outcomes value data. After obtaining the learning outcomes value data of the experimental class and control class students, the data is processed first with the descriptive method. Processed data from the descriptive method will describe the description of data such as mean, median, mode, maximum value, minimum value, and standard deviation. The processed data from this descriptive method will be presented in 1 table, namely the table listing the value of the comparison of learning outcomes of the control class students and the experimental class. In this table you will see a comparison of the learning outcomes of the two classes [12].

After that the final data analysis will be carried out which will present the data with the results of the normality test and the normalized gain test. The normality test is done to test whether the distribution of data is normally distributed or not. In order for research to continue, the distribution of research data must be normally distributed. While the normalized gain test is done to get a general description of the increase in the score of learning outcomes between the experimental group

and the control group. If the normalized gain value is  $\geq 0.7$  then it is included in the high category, if the normalized gain value is  $<0.7$  and  $\geq 0.3$  then it is in the medium category, and if the normalized gain value is  $<0.3$  then it is in the low category [13].

### III. RESULT AND DISCUSSION

#### A. Description of Data

In this section will be presented a table of tables listing the value of comparison of learning outcomes of control class students and experimental classes. In this table you will see the mean, median, mode, maximum value, minimum value, and conventional class standard deviation and e learning class. Because the table data is presented side by side between the control class and the experimental class, it can be seen a comparison of the learning outcomes of the two classes.

TABLE I. LIST OF VALUE COMPARISON OF LEARNING OUTCOMES BETWEEN CONTROL CLASS STUDENTS AND EXPERIMENTAL CLASS

No	Criteria	Conventional Class (control class)	E Learning Class (experimental class)
1	Mean	66.55	77.67
2	Median	70.14	82.36
3	Modus	71.53	95.28
4	Max	90.69	98.61
5	Min	31.53	44.31
6	Sd	14.77828667	15.4699931

(source: research data)

The description of the comparison between the experimental class and control class research data can also be seen in Figure 1 below.

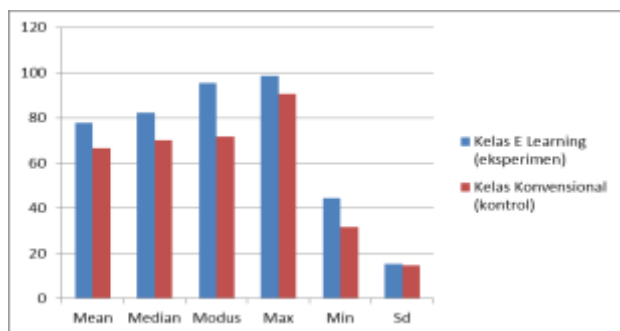


Fig. 1. Comparison research data between experimental class and control class

The following will be explained in detail regarding the value of the learning outcomes of the control class students (conventional), the value of the experimental class student learning outcomes (e learning), and the comparative value of the learning outcomes of the control class and the experimental class.

#### 1) Learning outcomes of the control class

Based on table 1 above, it is known that the average value of the control class is 66.55, the median or middle value is 70.14, the mode or value that often appears is 71.53, the

maximum value is 90.69, the minimum value is 31.53, and the standard deviation value is 14,778 .

#### 2) Learning outcomes of the E Learning class

Based on table 1 above, it is known that the average value of the experimental class is 77.67, the median or middle value is 82.36, the mode or value that often appears is 95.28, the maximum value is 98.61, the minimum value is 44.31, and the standard deviation value is 15,470.

#### 3) Comparison of learning outcomes of conventional E learning and class classes

Based on table 1 above, it is known that the average value of the control class is 66.55 while the average value of the experimental class is 77.67 so there is a difference of 11.2, the median or middle value of the control class is 70.14 while the median or middle value of the experimental class is 82.36 so there is a difference of 12.22, mode or value that often appears control class is 71.53 while the mode or value that often appears experimental class is 95.28 so there is a difference of 23.75, the maximum value of the control class is 90.69 while the maximum value of the experimental class is 98.61 so there is a difference of 7.92, the minimum value of the control class is 31.53 while the minimum value of the experimental class is 44.31 so there is a difference of 12.78, and the standard deviation value of the control class is 14.778 while the standard deviation value of the experimental class is 15,470 so there is a difference of 0.692.

From the results of the above research it is known that the learning outcomes of experimental class students are higher than the control class [14]. There are differences in mean, median, mode, maximum score, minimum score, and standard deviation. Of all these differences, the value of the experimental class is higher than the control class. Based on the results of this study it is proven that learning using e learning can improve student learning outcomes [15] [16].

#### B. Normality Test

To find out is the data normally distributed or not, the data normality test is carried out. Based on the results of the normality test it is known that both data from the control class and experimental class are normally distributed. For more details, look at the picture below.

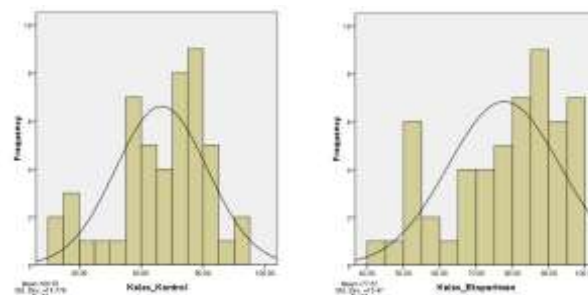


Fig. 2. The result of normality test

### C. Normalized Gain Test

To see the magnitude of the comparison of the learning outcomes between class using e learning and conventional classes, the normalized gain test is carried out. Based on the normalized gain test it can be concluded that learning using e learning can improve student learning outcomes well than conventional class.

TABLE II. THE RESULT OF NORMALIZED GAIN TEST BETWEEN CONTROL CLASS AND EXPERIMENTAL CLASS

No	Normalized Gain Test	Control Class	Experimental Class
1	Value	66.55	77.67
2	Category	medium	high

(source: research data)

The comparison between the control class and experimental class can also be seen in Figure 3 below.



Fig. 3. The result of Normalized Gain Test

Based on figure 3 above, known that value of experimental class or class using e learning in the learning process is 77,67 or higher than control class is just 66,55.

### IV. CONCLUSION

Based on the results of the study, it is known that there is a difference student learning outcomes between classes using e Learning and classes that do not use e Learning in the learning process. So it can be concluded that learning using e learning can improve student learning outcomes. Researchers suggest that educators consisting of teachers and lecturers to make the e learning method as an alternative to improve student or student learning outcomes in accordance with current developments. The author also provides recommendations to further researchers to develop learning methods using e learning.

### References

- [1] H. Kanematsu, N. Ogawa, T. Shirai, M. Kawaguchi, T. Kobayashi, and D. M. Barry, "Blinking Eyes Behaviors and Face Temperatures of Students in YouTube Lessons-For the Future E-learning Class," *Procedia Comput. Sci.*, vol. 96, no. September, pp. 1619–1626, 2016.
- [2] N. Songkram, "E-learning System in Virtual Learning Environment to Develop Creative Thinking for Learners in Higher Education," *Procedia - Soc. Behav. Sci.*, vol. 174, pp. 674–679, 2015.
- [3] *UU RI No.20 Tahun. 2003*, p. BAB 1 Pasal 1.
- [4] C. T. Anni, *Psikologi Belajar*. Semarang: UNNES, 2006.
- [5] R. Rusdinal and H. Afriansyah, "Create Class Climate Effectively in Kindergarten," *Atl. Press*, 2018.
- [6] D. M. Barry, H. Kanematsu, K. Nakahira, and N. Ogawa, "Virtual workshop for creative teaching of STEM courses," *Procedia Comput. Sci.*, vol. 126, pp. 927–936, 2018.
- [7] D. M. Barry, H. Kanematsu, M. Lawson, K. Nakahira, and N. Ogawa, "Virtual STEM activity for renewable energy," *Procedia Comput. Sci.*, vol. 112, pp. 946–955, 2017.
- [8] X. SUN, H. LIU, G. WU, and Y. ZHOU, "Training effectiveness evaluation of helicopter emergency relief based on virtual simulation," *Chinese J. Aeronaut.*, vol. 31, no. 10, pp. 2000–2012, 2018.
- [9] I. Semradova and S. Hubackova, "Learning Strategies and the Possibilities of Virtual Learning Environment," *Procedia - Soc. Behav. Sci.*, vol. 83, pp. 313–317, 2013.
- [10] H. Kanematsu, T. Kobayashi, N. Ogawa, D. M. Barry, Y. Fukumura, and H. Nagai, "Eco car project for japan students as a virtual PBL class," *Procedia Comput. Sci.*, vol. 22, pp. 828–835, 2013.
- [11] H. Afriansyah, "Pengembangan Model Pembelajaran Virtual (MPV) Berbasis Video E-Learning Moodle," *Bahana Manaj. Pendidik.*, vol. 8, no. 1, pp. 52–58, 2019.
- [12] W. Sanjaya, *Perencanaan dan Desain Sistem Pembelajaran*. Jakarta: Kencana, 2009.
- [13] N. Chayyi, "Perbandingan Hasil Belajar Siswa antara Kelas yang Menggunakan Metode Pemecahan Masalah (Problem Solving) dengan Kelas yang Menggunakan Metode Konvensional pada Materi Indeks Harga dan Inflasi Siswa Kelas X Madrasah Aliyah Matholi'ul Huda Troso Pecangaan," Universitas Negeri Semarang, 2013.
- [14] V. Liagkou, D. Salmas, and C. Stylios, "Realizing Virtual Reality Learning Environment for Industry 4.0," *Procedia CIRP*, vol. 79, pp. 712–717, 2019.
- [15] M. Simkova and J. Stepanek, "Effective Use of Virtual Learning Environment and LMS," *Procedia - Soc. Behav. Sci.*, vol. 83, pp. 497–500, 2013.
- [16] R. Phungsuk, C. Viriyavejakul, and T. Ratanaolarn, "Development of a problem-based learning model via a virtual learning environment," *Kasetsart J. Soc. Sci.*, vol. 38, no. 3, pp. 297–306, 2017.