

Application of Blog-Based E-Learning to Improve Cognitive Learning Outcomes and Independent Characters

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Abstract

The roles of technology have influence on the progress of education, one of them is developed in education based on the Regulation of the Minister of Education and Culture of the Republic of Indonesia Number 65 of 2013 namely the use of information technology that is used to improve the efficiency and effectiveness of learning. The purpose of this study was to determine the effect of implementing blog-based e-learning in improving cognitive learning outcomes and independent characters in the thematic learning of fifth grade elementary school. This study used a quasy experimental design with two classes of research objects consisting of a control and an experimental class. The sample was 63 students. The result of this research shows that was that there was a significant increase in student learning outcomes and independent characters. The average increase in learning outcomes of 84% was in the very good category. In addition, the application of learning using blog-based e-learning in thematic learning makes the desire to compete enhance learning and be able to work independently is in the very high category. The average N-Gain test was of 0.49 which was in the medium category. It showed that the increase in cognitive learning outcomes in the experimental class using blog-based e-learning was more effective than the control class using google classroom.

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INTRODUCTION

The world has entered the era of globalization with information technology that is developing rapidly fast. In a learning process, it is necessary to use technology and media development. Technology is a means that allows the creation of the necessary learning environment in which the learning process can be realized in the most effective way (Kiryakova et al., 2018). Advances in information and communication technology have changed a person's perspective and lifestyle in their activities.

In this era, technology has an influence on the progress of education, one of which is developed in education based on the Regulation of the Minister of Education and Culture of the Republic of Indonesia Number 65 of 2013 namely the use of information technology used in learning to increase efficiency and effectiveness. Harto (2018) in his research explained that an educator is required to have four competencies in order to be able to use digital technology effectively. The competencies are: must understand and be able to use digital technology and its application, have leadership competencies that are able to direct students to have an understanding of technology, have the ability to accurately predict the direction of the turmoil of change and strategic steps to deal with it, and an educator should can control themselves from all the turmoil of change, and be able to face it by bringing up ideas, innovation, and creativity.

Utilization of technology can be developed

as one of the new innovations in the use of learning media and learning resources. According to Wulandari (2020) the use of learning media used in the process of teaching and learning activities in the classroom can motivate these students to be more enthusiastic and focused on learning. Keengwe & Georgina (2012) explained that technological developments provide changes to the implementation of teaching and learning. Information technology can be accepted as a

medium in carrying out the educational process, including helping the teaching and learning process, which also involves finding references and sources of information (Wekke & Hamid, 2013).

Several studies have shown that technology has many positive effects on language learning such as reading using videos (Gheytsi, 2015). Starting from traditional face-to-face learning, technology has positively changed our education and led to the concept of e-learning, namely delivering learning digitally. According to Setyoningsih (2015) e-learning is a teaching and learning activity that allows the delivery of teaching materials to students using the internet, intranet or other computer network media. Student character values can also be instilled using the internet as a source of information retrieval. Character values that can arise include curiosity, responsibility, critical, independent, and confident (Surbakti & Supartono; 2016).

Character is a way of thinking and behaving that is unique to everyone to live and work together, both in the family, community, nation, and state environment. According to Harun (2013), individuals who have good character are individuals who are able to make decisions and be responsible for what they have done, the main thing is the character in relation to God Almighty. In line with this idea, Pasani (2013) explained that character education is everything that teachers do to affect the character of students. Thus in character education all components must be involved, including the components of education itself.

The Ministry of National Education (2010) stated that there are 18 characters consisting of: religious, honest, tolerance, discipline, hard work, creative, independent, democratic, curiosity, national spirit, love of the homeland, appreciating achievement, friendly/communicative, love of peace, loves to read, cares for the environment, cares for social, and responsibility. Looking at the 18 characters that have been described, the independent character is one of the important characters and needs to be instilled in students. Based on

interviews with teachers, many parents and teachers complain that their children or students are less independent, carrying out their own tasks, lazy to look for reference sources, and not eager to learn.

From these problems, a new method is needed, in which character education is an important component. One way to overcome these problems can be done through optimizing the use of media. The use of technology, of course, e-learning is one of the most relevant. In this case, the Internet has been integrated into a tool that is used to complete learning activities (Martins, 2015). E-learning is a learning system that is not done face-to-face but uses a platform that can help the teaching and learning process that is carried out even though it is far away. The purpose of using e-learning is to provide quality learning services in an open network to reach more and wider interest in learning spaces (Sofyana & Abdul, 2019). In line with this idea, Kuo (2014) stated that online learning is more student centered so that it can bring up responsibility and autonomy in learning. In other words, students become more able to grow independence in learning. Through independent learning, at least teachers can teach independent, honest, and responsible. Through the assignment system for learning outside the classroom, the teacher also teaches independent character and discipline. In addition, learning that emphasizes exploration of the surrounding material can provide a stimulus for students to have awareness of environmental conservation.

The relationship between understanding concepts and practicing character aspects is an ideal form of learning achievement, both of which can include cognitive (concept understanding), affective, and psychomotor (character). Therefore, an appropriate educational instrument is needed to educate students to achieve the above aspects namely by implementing e-learning blog assisted.

According to Özdemir & Aydın (2015) blogs can be used for the learning process through a process-based approach so that students can improve their abilities including content, organization, discourse markers,

vocabulary, sentence construction, and writing mechanisms. Sukmawati (2017) added that blog was chosen as a supporting technology because it is free, has unlimited bandwidth, is free of ads, is a secure platform, and is Search Engine Optimization (SEO) friendly. In line with this, (Nazalin & Muhtadi, 2016) said that free learning resources available on the internet can be used to present and visualize teaching materials with the aim of increasing conceptual understanding, reasoning, problem solving abilities, and even increasing curiosity and creativity of the students. This is also explained by Mustaqim (2017) that a good learning process must contain interactive, fun, challenging, motivating aspects and provide more space for students to be able to develop creativity and independence according to students' talents and interests.

An investigation has been carried out in Kalipancur 02 Elementary School, Semarang City. Observational data show that the school has applied the 2013 curriculum which should fully support integrated technology. Thematic learning is not a new thing in Indonesia. This learning has been carried out since 2014, marked by the regulation of the Minister of Education and Culture number 57 of 2014 concerning the 2014 curriculum for Elementary Schools and Madrasah Ibtidaiyah. This learning contains a predetermined model, namely thematic and integrated. It was also found that in Kalipancur 01 Elementary School the use of Information and Communication Technology in learning has not been optimal. The generally applied learning methods are the lecture method, assignment of questions, and summarizing the material. These methods do not assign students much to explore sources and learning materials independently, especially by utilizing internet connection facilities. With proper utilization, internet network facilities should be able to further support the success of learning. In this case, the potential for technological facilities is still very minimal.

Based on interviews with several teachers, learning still used lectures and assignments in the form of practice questions. LCD projector

facilities are still rarely used. The absence of the use of this technological facility is indeed because the teacher does not prepare learning with a multimedia approach. The learning resources prepared were standard textbooks. While the technique of delivering material used more whiteboard tools to explain directly. In addition, the learning resources used are still limited and there are no learning media available that involve students actively in the learning process so that students have difficulty understanding material concepts. This has an impact on student learning outcomes which are still below the Minimum Completeness Criteria (KKM).

Results of interviews with students also showed that students were still dependent on others in learning. Students still must be asked by their parents to study, not on their own accord. The results of observations also showed that during learning activities students' confidence in their work is still lacking. This can be seen when there was a student who has finished working on an assignment when another student has not finished, when they asked by the teacher whether it was finished, the student did not answer. Moreover, the friend sitting behind him said that the student had finished. Due to his mate report, the student showed the results of his work to the teacher.

The problems discussed were strengthened by the results of interviews with several students. Most of the students were not sure that the students' subject grades will be good. The results of interviews with several students also showed that student learning planning was still lacking. Students did not study if there was no homework. Students also have not maximized learning resources. This was based on the results of interviews with students and teachers that students rarely do group study to deepen their understanding of the material. Students also rarely visit the school library. In addition, the data from the mid-semester test results showed that student learning outcomes were low. This was evidenced by the student scores not meeting the minimum completeness criteria (KKM) that have been determined by the

school, which was 75. Data in 2019/2020 there were 66.67% of students who have not achieved classical completeness. If these problems were not resolved, they will have an unfavorable impact on the period of further education. Students who were less independent in learning, which can lead to poor study habits, such as not feeling comfortable studying for long or studying only before exams, truancy, cheating, and looking for leaked exam questions.

Based on the evidence and data discussed, it is important to investigate about the effectiveness of e-learning based on blogs. The research was carried out for the purpose of increasing the character of independence and student learning outcomes in thematic learning.

Research on the development of the effectiveness of E-learning has been carried out by Ibrahim (2014) who explained that it can be concluded that there was a positive influence on the use of e-learning on student achievement in mathematics at the Yogyakarta Annual State Elementary School. There was an effect of the use of e-learning on students' learning motivation and the tendency of students' motivation to use e-learning was higher than conventional learning. So, it can be concluded that there was a positive effect of using e-learning on students' learning motivation. In line with this, Zauma (2020) explained that if motivation increases, learning outcomes will also increase. Research conducted by Ibrahim discusses the effect of e-learning on learning achievement but has not discussed independent character. In addition, the focus of the research carried out is mathematics, while the researchers focus on thematic learning.

This purpose of this study was to analyze the effect of blog-based e-learning in improving cognitive learning outcomes and independent character in thematic learning of fifth grade elementary school.

METHOD

The research design used in this study was a quantitative model in the form of a quasy experimental design. The form of quasy

experimental design used was pretest-posttest control group design. Researchers use the design to determine the effectiveness of e-learning blog based on thematic learning outcomes. The technique used in this research was random sampling. The samples in this study were Kalipancur 01 Elementary School which was given e-learning treatment using blog media and Kalipancur 02 Elementary School which was given e-learning treatment using google classroom media. All the fifth graders will be used as research samples.

The independent variable in this study was the e-learning model blog based on thematic learning of fifth grade elementary school students. The dependent variable in this study was the student's cognitive learning outcomes and independent characters who were treated in learning using a collaborative e-learning model blog based on thematic learning of fifth grade of elementary school. Independent character data collection was taken from a questionnaire after learning. While the cognitive learning outcomes data was taken from the test.

The instruments used to measure the variables studied included independent character instruments, the implementation of blog -based e-learning, and student cognitive learning outcomes. To measure students' cognitive learning outcomes, the instrument used was a written test in the form of multiple-choice questions.

The internal validity of the instrument in the form of a test must meet construct validity and content validity. As for the construct validity of the self-confidence questionnaire instrument, and the test questions have been tested on the validator. Content validity was validity based on the instrument grid that has been made. So, the instrument/measuring instrument must be in accordance with what was known by the measuring object. The formula used for the validity of the test in this study was the Pearson product moment correlation formula. From the item validity test, there were

25 invalid test questions and 50 valid test questions. Furthermore, invalid test questions will be eliminated or not used again when collecting research data. The reliability test used the formula of Kuder-Richardson 20 (KR.20). The test results showed the Cronbach alpha value of 0.959 which indicated a very high level of reliability.

The data collection technique in this study was instrument testing and instrument validity testing. The statistical analysis and model used were prerequisite tests which included normality and homogeneity tests, average similarity tests, two-average similarity tests, classical completeness tests, and N-Gain tests. The normality test was calculated using SPSS version 20 with a level of 5% (0.05). To find out whether the data was normal or not, it was seen from the significance value. If the value of $\text{sig} > 0.05$, it can be said that the data was normally distributed.

The statistical formula used was the Kolmogorov-Smirnov test, the homogeneity test Data can be done using Levene's test with the help of SPSS version 16. To analyze the average similarity test, the independent sample t-test was employed. Scoring for the students' self-confidence questionnaire was carried out using a Likert scale by making the intervals into 4 criteria, namely very good, good, enough, and less. The score for the self-confidence scale in this study ranged from 1 to 4.

RESULTS AND DISCUSSION

a. Students' Cognitive Learning Outcomes Using Blog-Based E-Learning in Thematic Learning for Fifth Grade Elementary School

The descriptive data from the control class research regarding the cognitive learning outcomes of fifth grade students at Kalipancur 2 Elementary School are presented in Table 1.

Table 1. Descriptive Statistics of Cognitive Learning Outcomes of Control Class Students

	N	Min	Max	mean	Std. Deviation
pre_control	38	5 5 0.00	9 9 8.00	6 6 5. 89	10.28
post_control	38	5 5 6.00	9 9 2.00	7 7 5.73	08.60
Valid N (listwise)	38				

Furthermore, descriptive data from experimental research on cognitive learning outcomes of fifth grade students at Kalipancur 01 Elementary School are presented in Table 2.

Table 2. Descriptive Statistics of Experimental Class Cognitive Learning Outcomes

	N	Min	Max	mean	Std. Deviation
pre_experiment	25	50.00	76.00	64.56	7.517
post_experiment	25	62.00	94.00	82.0 8	7.220
Valid N (listwise)	25				

Before the two samples were given different treatment, a pre-test was given to determine the initial ability of each student in both classes, and to find out that the two classes were normally distributed and homogeneous. Furthermore, different learning was carried out, namely the experimental class was given treatment with blog-based e-learning and the control class was given treatment with

classroom-based e-learning. At the end of the learning process, a final test will be given to determine the improvement of student learning outcomes. Based on the calculation of the gain of the two sample classes, the average learning outcomes of the experimental and control classes were obtained which are summarized in Figure 1.

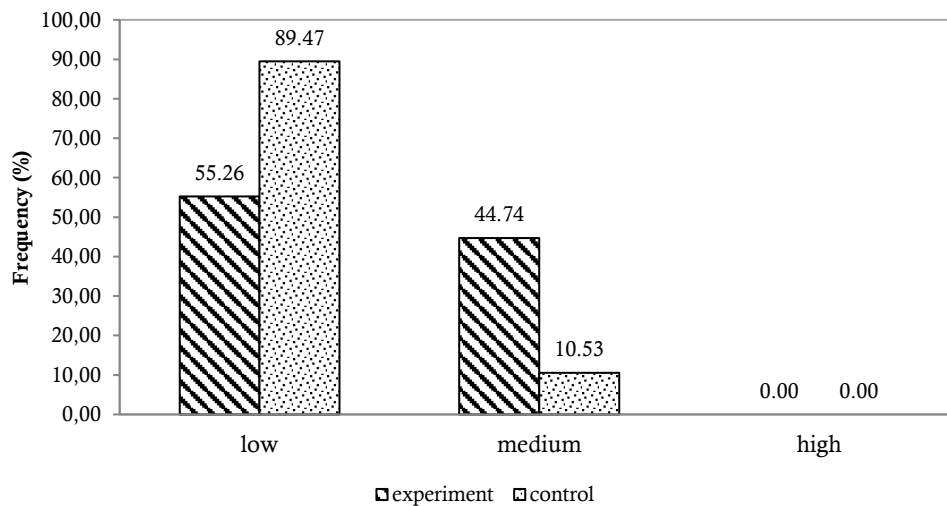


Figure 1. N-Gain Category Cognitive learning outcomes

This showed that the increase in cognitive learning outcomes in the experimental class using e-learning Blog-based was more effective than control classes that use classrooms. There was an increase in learning outcomes due to the use of blog-based e-learning as a source of independent learning in the experimental class.

This showed that blog-based e-learning as a source of independent learning contributes to improve learning outcomes in the experimental class and it was better when compared to classes that use classrooms.

This was in a line with research conducted by Okan & Taraf (2013) which

explained that blogs have encouraged students to develop the necessary new knowledge and skills. Septiana (2021) also explained that the use of blogs is very helpful for students and teachers in the learning process. In line with this, Hidayati (2010) concluded that this web-based e-

learning can be more interactive in the learning process. In this case, e-learning helps students learn the material and makes students more motivated so that learning outcomes can be achieved optimally as shown in Figure 2a and 2b.

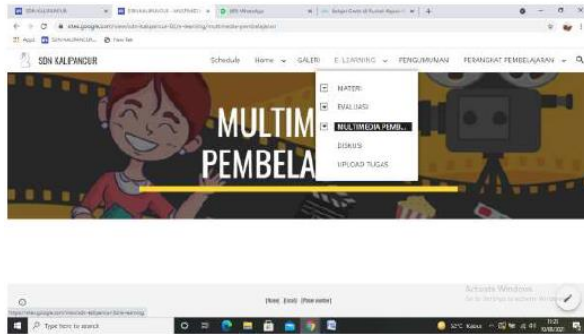


Figure 2a Handout blog

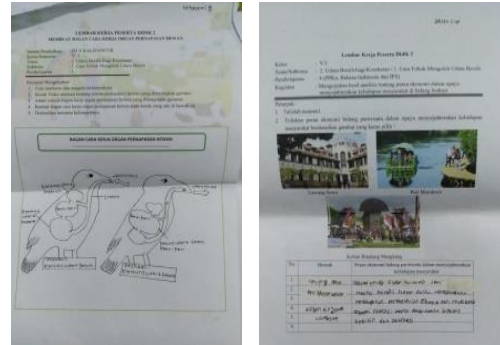


Figure 2b Student worksheet

b. The Character of Independence Using Blog-Based E-Learning in Thematic Learning for Grade V Elementary School

The results of the study on the independent character of fifth grade students using the blog based e-learning method at

Kalipancur 01 Elementary School are presented in Table 3.

Table 3 Average Student Independence Character in Each r Indicator

Indicator	Average	core (%)	Category
The desire to compete to advance	3.22	80.60	very high
Can make decisions	2.81	70.33	high
Have a sense of initiative	3.01	75.25	high
Have confidence	2.99	74.75	high
Can be responsible	2.93	73.25	high
Able to give opinion	2.28	57.00	moderate
Can work alone	3.86	96.50	very high

Student independence can be measured through the desire to compete to advance, can make decisions, have a sense of initiative, have self-confidence, can be responsible, able to give opinions, and can work alone. From the table analysis it can be seen that the application of learning using blog based e-learning on thematic lessons make students' independence scores

higher on the indicator of the desire to compete to advance and be able to work alone with a score of more than 80% which was in the very high category.

To find out more about the following categories of student independence, a percentage distribution graph is presented in Figure 2.

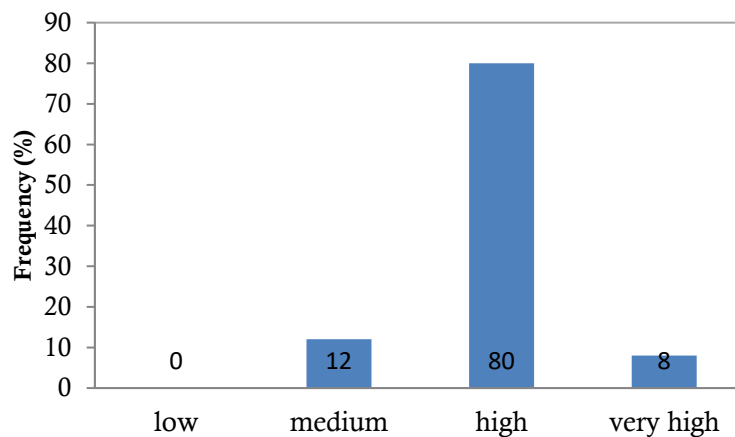


Figure 2. Frequency Distribution of Student Independence

Based on the Figure 2 the majority of students have a level of independence that was in the high and very high categories. This indicated that after learning using the learning method using Blog-based e-learning on thematic lessons, students become more independent individuals in working on questions, studying, and discussing. Students also become more confident in answering questions and giving opinions in class discussions. E-learning is considered capable and effective in increasing learning independence because e-learning is a classroom that can be accessed easily by students anywhere and anytime (Gumilar & Hermawan, 2021 and Nugraheni & Dina, 2017). The implementation of learning using blog-based e-learning can effectively increase student independence, as indicated by the average score of student independence in learning which is in the medium to very high category on each indicator. E-learning can also train students independently in finding materials and subject matter to increase their knowledge so that students can play an active and responsible role in the learning process (Arifin & Herman, 2018). E-learning also makes students more time efficient, and students can construct their own knowledge, because all materials and enrichment questions can be accessed quickly.

The results also showed that the indicators of the competitive desire for advancement and the indicators of being able to work alone are in the very high category with a

score of more than 80%. This showed that students after learning have high motivation and self-confidence, thus making these students have the desire to become superior individuals and make the classroom environment more enthusiastic in learning. In addition, field facts also showed that students who previously often asked friends when asked questions or during exams became more independent students in doing assignments and tests after learning using blog-based e-learning in thematic learning. This is in line with the opinion of Arifin & Herman (2018), which states that e-learning can make students more independent in learning because using online learning portals is fun and students can explore the material.

Another thing that can be found in students' learning independence after learning was that they can make decisions, have a sense of initiative, have confidence, and can be responsible which have an average score of more than 70% and were categorized in high learning independence. This was also shown from the results of research which stated that most students have independence at the high to very high category level. So that blog-based e-learning can be said to be effective in increasing student learning independence, this was in line with research conducted by Hidayah et al. (2016) which states that blog -based learning media is quite effective on student learning independence. Meanwhile, Samosir et al. (2019) explained that blog-based E-learning is used to develop students

in independent learning so that students' knowledge of the material will increase so that the learning outcomes obtained will increase. Anas & Munir (2020) also stated that the application of e-learning can increase the learning independence of students who were originally categorized as being very good.

c. The Influence of the Implementation of Blog-Based E-Learning in Improving Cognitive Learning Outcomes and Independent Characters in Thematic Learning for Fifth Grade Elementary School

1) Classic assumption test

a) Normality test

This analysis was used to see the condition of the pretest data and posttest data from the control class and the experimental class. The normality test was conducted to determine whether the pretest and posttest data were normal in the students' cognitive learning outcomes obtained in the study. The hypothesis used in the normality test is.

H0: data is normally distributed

H1: data is not normally distributed

The data is said to be normally distributed if the value of Sig. (2-tailed) > 0.05. The results of the normality test are presented in Table 4.

Table Error! No text of specified style in document.Data Normality Test Results

Learning Outcome Data	N	Kolmogorov-Smornov	Sig. (2-tailed)	Description
Pretest control	38	0.751	0.622	Normal
Experimental pretest	25	0.566	0.905	Normal
Posttest control	38	1.009	0.261	Normal
Experimental posttest	25	0.677	0.748	Normal

Based on the data displayed on Table 4, it was known that the value of sig. (2-Tailed) generated in the control class pretest data was 0.622 and the posttest was 0.261 and the sig value in the experimental class pretest was 0.905 and the posttest was 0.748. Because the value of Sig. in the control and experimental classes, both pretest and posttest data > 0.05, then H0 was accepted, which means that the data was normally distributed.

b) Homogeneity Test

Homogeneity test was conducted to determine whether the research data to be analyzed had the same variance or not. The hypothesis used in the homogeneity test is

H0: homogeneous data variance

H1: data variance is not homogeneous

The data is said to be homogeneous if the resulting sig value is more than 0.05. The results of the axle homogeneity test can be seen in Table 5.

Table 5. Homogeneity Test Results

	Levene Statistics	df1	df2	Sig.
Pre	1,881	1	61	0.175
post	1,579	1	61	0.214

Based on Table 5, it was known that the value of sig. The result of cognitive learning outcomes of pretest data was 0.175 and post-test data was 0.214. Because 0.175 and 0.214 > 0.05; then H0 was accepted which means that the data variance was homogeneous.

2) Comparative Test of Cognitive Learning Outcomes

To find out that the Blog-Based E-learning method was more effective in improving students' cognitive learning outcomes than the lecture learning model, the posttest student learning outcomes data will be compared with the control class using the independent sample t-test test with the following hypothesis.

$H_0: \mu_1 \leq \mu_2$ (the average cognitive learning outcomes of experimental class students are less than or equal to the average cognitive learning outcomes)

$H_0: \mu_1 \leq \mu_2$ (the average cognitive learning outcomes of experimental class students are more than or equal to the average cognitive learning outcomes)

Based on the results of the comparative test with SPSS 20 using the independent sample t-test with a significance level of 0.05, it was found that the significance value between the control class and the experimental class was $0.003 < 0.05$, this indicates that there was a significant difference in the average results. experimental class cognitive learning with control class students after being given treatment.

To find out the higher average cognitive learning outcomes, further tests were held by looking at the mean of the two classes being compared. The average posttest cognitive learning outcomes of the experimental class were 82 and the control class was 75.74, so the experimental class's cognitive learning outcomes were better than the control class. So, it can be concluded that the average cognitive learning outcomes of students in thematic lessons in the experimental class was higher than the average cognitive learning outcomes in the control class.

The normality test was used to see the condition of the pretest and posttest data from the control class and the experimental class. The normality test was conducted to determine whether the pretest and posttest data were normal in the students' cognitive learning outcomes obtained in the study. From the research results it was known that the value of sig. (2-Tailed) generated in the control class pretest data was 0.622 and the posttest was 0.261 and the sig value in the experimental class pretest was 0.905 and the posttest was 0.748. Because the value of Sig. in the control and experimental classes, both pretest and posttest data > 0.05 , then H_0 was accepted, which means that the data was normally distributed.

After the normality test, the researcher conducted a homogeneity test to find out

whether the research data to be analyzed had the same variance or not. From the research results it was known that the value of sig. The result of cognitive learning outcomes of pretest data was 0.175 and post-test data was 0.214. Because 0.175 and $0.214 > 0.05$; then H_0 was accepted which means that the data variance was homogeneous.

To find out the blog-based E-learning method is more effective in improving students' cognitive learning outcomes than the lecture learning model, the posttest student learning outcomes data will be compared with the control class using the independent sample t- test. Based on the results of the comparative test with SPSS 20 using the independent sample t-test with a significance level of 0.05, it was found that the significance value between the control class and the experimental class was $0.003 < 0.05$, this indicates that there was a significant difference in the average results. experimental class cognitive learning with control class students after being given treatment.

To find out the higher average cognitive learning outcomes, further tests were held by looking at the mean of the two classes being compared. The average posttest cognitive learning outcomes of the experimental class were 82 and the control class was 75.74, so the experimental class's cognitive learning outcomes were better than the control class.

Based on the analysis of research results after the implementation of blog - based e-learning in thematic learning, it can be shown that the average cognitive learning outcomes of students in thematic lessons in the experimental class were higher than the average cognitive learning outcomes in the control class. Therefore, it can be concluded that the application of blog-based e-learning was more effectively applied in thematic learning compared to the application e-learning based Google classroom. This is in line with research conducted by Muazizah (2016) which stated that the application of e-learning-assisted learning can improve student learning outcomes. According to Utami (2016), one of the facilities available on the internet network and relatively

easy to use and access in general is a blog. As for Mahmudi (2021) added that the presence of blog then learning is more optimal so that the quality of education is expected to continue to increase.

CONCLUSION

Based on the results of the study, the implementation of Blog-Based e-learning can be implemented improve cognitive and independent learning outcomes in thematic learning of fifth grade of elementary school, the application of blog-based e-learning can effectively increase students' independence. In addition, the application of e-learning can also train students independently in finding materials and subject matter to increase their knowledge so that students can play an active and responsible role in the learning process. Application of blog-based e-learning is more effectively applied in thematic learning compared to the application of e-learning based on google classroom.

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