International Journal of Social Science And Human Research

ISSN(print): 2644-0679, ISSN(online): 2644-0695

Volume 03 Issue 12 December 2020

DOI: 10.47191/ijsshr/v3-i12-01

Page No : 365-370

Effectiveness of Online Learning Implementation in Topic Dynamic Electricity during the Covid-19 Pandemic at Junior High School

Muhammad Habibbulloh[1], Moh. Nurman[2], Dinar Maftukh Fajar[3]

[1,2]FKIP Universitas Islam Lamongan, Jl. Veteran 53A Lamongan, East Java, Indonesia
[3]IAIN Jember, Jl. Mataram no. 1, Jember, East Java, Indonesia

ABSTRACT: This study aims to determine the effectiveness of the implementation of online learning on dynamic electricity topics carried out in junior high schools during the Covid-19 pandemic. Effectiveness is seen from the completeness of learning outcomes, obstacles faced during learning, and student responses to online learning. The research method used in this research is quantitative descriptive with one group pre-test post-test design. The sample used in this study were 64 junior high school students in one of the state junior high schools in Lamongan Regency, East Java. The results of the research obtained were that the average completeness of student learning on dynamic electricity material with an online learning model was very low (below the minimum completeness standards), analysis of the N-Gain value gets a value of 0.23 and is categorized as low. Statistical analysis with the help of SPSS 22 shows that the sample is normally distributed and hypothesis testing shows that online learning has no effect on increasing the value of student learning outcomes. There were many obstacles during the online learning process even though solutions had been given but there were not resolved properly, one of the obstacles was the need real lab. Student response to online learning is quite positive 63%. The conclusion of this study is that online learning is not effective enough to be used at the junior high school level and improvements are still needed in terms of facilities and infrastructure.

KEYWORDS- Online Learning Implementation, Dynamic Electricity, Covid-19 Pandemic.

INTRODUCTION

The Covid-19 pandemic has forced changes in all aspects of life. one of which is in the field of education, the application of online learning is one option that can be done to replace face-to-face learning that has been done in schools. Online learning is a distance learning that uses technology in its implementation [1] [2] [3]. Taylor [4] has grouped the generation of distance learning into five generations, namely: (1) correspondence model, (2) multi-media model, (3) tele-learning model, (4) flexible learning model, and (5) the smarter flexible learning model (The Intelligent Flexible Learning Model).

Online learning carried out at the junior high school level, especially science subjects, the topic of dynamic electricity really requires practicum [5]. during a pandemic, it is very difficult to carry out practicum. this is because since March 2020 learning throughout Indonesia under the ministry of education and culture has been carried out remotely or from home / SFH (school from home) considering that at that time the Covid-19 pandemic was increasing sharply and was very dangerous and risky if learning continued at school and face to face in person. This risk applies to everyone, whether teachers, students, or other school members because of the very rapid transmission. departing from these facts the research team wanted to know the extent to which the effectiveness of online learning carried out in school with all the shortcomings that exist in terms of completeness of learning outcomes, obstacles that arise during learning, and also student responses to online learning.

Online learning carried out at the junior high school level is a distance learning using several applications that help teachers explain dynamic electricity learning material. According to Blaschke [2] online learning constitutes a form of education that accommodates learners' individual needs beyond traditional face-to-face instruction. Some of the applications used by the teacher in this lesson are zoom meet, google classroom, as well as WhatsApp and telegram chat applications. In dynamic electricity learning, the teacher explains the theory directly through a zoom meet, sends teaching materials and assignments in the classroom and monitors the progress via WhatsApp and gives interactive quizzes using telegram [6][7].

referring to Kibuku's research [8] which states that further development and investigation is needed on the contributions of classical learning theories such as Behaviorism, Cognitivism and Constructivism to e-learning, besides that according to Holbeck [9] applying technology can increase Cognitive Presence, Social Presence, and Teaching Presence, and according to Kusmaharti's

research [10] states that online learning is effective in improving problem-solving skills and there are still some obstacles to online learning, so that researchers study the effectiveness of online learning at junior high school level in science subjects with dynamic electricity topics in terms of completeness of learning outcomes, constraints during online learning, and student responses.

METHOD

The research method used in this research is quantitative descriptive with one group pre-test post-test design [11]. The sample used was 64 students of grade IX SMP in a state school in Lamongan district. The following is the research design table used:

Table 1. Design of Research

Pre-test	Treatment	Post-test
O1	X	O2

The analysis carried out in this study begins with the N-gain test of the pre-test and post-test values. N-Gain is a measurement taken before and after the treatment is given [12]. N-Gain is obtained by the equation:

$$N-gain = \frac{S_{post}}{S_{maks}} - \frac{S_{pre}}{S_{pre}}$$

As for the criteria for N-Gain value according to Hake [13] are:

Table 2. N-Gain Criteria

N-Gain Score	N-Gain Criteria
0.00 < N-Gain < 0.30	Low
0.30 ≤ N-Gain ≤ 0.70	Middle
N-Gain > 0.70	High

Furthermore, the analysis was carried out by testing the normal distribution of the data pre-test and post-test used SPSS 22 [14][15][16]. The One-Sample Kolmogorov-Smirnov Test table shows the results analysis of the normality test of these variables.
Research Hypothesis:

H0: Samples are normally distributed.

H1: The sample is not normally distributed.

Terms If Asymp. Sig (2-tailed) ≥ α, then Ho is accepted. If Asymp. Sig (2-tailed) <α, then Ho is rejected.

After obtaining the results that the data is normally distributed as one of the requirements for hypothesis testing, then the hypothesis is tested on the sample with a significant level of α = 0.05.

The One-Sample Test table displays the results of the online learning analysis that has an effect on increasing the value of student learning outcomes with a hypothesis.

H0: Online learning has an effect on increasing the value of student learning outcomes.

H1: Online learning has no effect on increasing the value of student learning outcomes.

Provisions

If Sig (2-tailed)> ½ α, then Ho is accepted.

If Sig (2-tailed) <½ α, then Ho is rejected.

This statistical analysis is also equipped with qualitative data, namely the obstacles faced by teachers and students during the online learning process and student response data. Student response data were obtained using a questionnaire. Response questionnaires are used to obtain information related to student opinions.

DATA ANALISYS

A. Completeness of Learning Outcomes

Based on the pre-test and post-test student learning outcomes, it was found that the pre-test average score was 43.44 and the post-test was 56.33. This average score is still far below the minimum completeness standard enforced at the school, namely 75.00. So that the pre-test and post-test mean scores can be categorized as very low.

The analysis of manual N-Gain calculations, the Normalized Gain mean of the pre-test and post-test values for the 64 research samples was 0.23. this value belongs to the "low" category. This measurement shows that the increase in student learning outcomes between before and after the implementation of online learning on dynamic electricity topics is low. There are many factors that make up the low N-gain value obtained in this study. one of which is the ability of students to grasp the concepts

conveyed by the teacher online, besides that the unavailability of real laboratories has also exacerbated the online learning process carried out during the pandemic.

Then the data of pre-test, post-test, and N-Gain are tested with normal distribution or not. Normal distribution of data using SPSS 22 obtained data in table 3:

Table 3. One-Sample Kolmogorov-Smirnov Test

		Pre-test	Post-test	N-Gain
N		64	64	64
Normal Parameters[a,b]	Mean	43.44	56.33	.2274
	Std. Deviation	15.933	17.554	.19245
Most Extreme Differences	Absolute	.153	.110	.125
	Positive	.153	.089	.125
	Negative	-.071	-.110	-.103
Test Statistic		.153	.110	.125
Asymp. Sig. (2-tailed)		.051[c]	.052[c]	.054[c]

a. Test distribution is Normal.
b. Calculated from data.
c. Lilliefors Significance Correction.

Based on the results of testing the normal distribution with SPSS 22, it is found in table 3 that the Asymp value. Sig. (2-tailed) respectively (pre-test, post-test, and N-Gain) was 0.051; 0.052; and 0.054> α 0.05. Thus, the hypothesis H0 is accepted and it can be concluded that the samples data are normally distributed. This means that further hypothesis testing can be done, namely testing the effectiveness of online learning to improve learning outcomes.

The One-Sample Test table displays the results of the online learning analysis that has an effect on increasing the value of student learning outcomes with a hypothesis.

H0: Online learning has an effect on increasing the value of student learning outcomes.

H1: Online learning has no effect on increasing the value of student learning outcomes.

Provisions

If Sig (2-tailed)> ½ α, then Ho is accepted.

If Sig (2-tailed) <½ α, then Ho is rejected.

Table 4. One-Sample Test

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
N-Gain	9.454	63	.000	.22742	.1794	.2755

Based on the results of the t-test hypothesis test with SPSS 22 in table 4, it is found that Sig. (2-tailed) N-Gain is 0.000 < ½ α (0.0025), based on the test criteria, it shows that H0 is rejected and H1 is accepted. so, it can be concluded that online learning has no effect on increasing the value of student learning outcomes. A disappointing result to disclose, but it must still be conveyed considering that the online learning model is a learning model that can be used as a substitute for face-to-face learning [17], during the Covid-19 pandemic. There are many factors that cause negative results in this study. The dominant thing that can be observed directly based on the research team's observations is the availability of facilities and infrastructure (listed in the obstacles during learning). In addition, the very striking changes in learning patterns between before the pandemic and during the pandemic also forced students to adapt to changes. The level of adaptation of students to technology varies from one student to another. this also exacerbates the online learning process that is being carried out.

B. The Obstacles Faced by Teachers and Students During the Online Learning Process

The following are the obstacles that were found during online learning from the observations of the research team as well as the efforts made to resolve these obstacles:

Table 5. Obstacles During Online Learning

#	Obstacles	Solution
1.	Internet signal when online learning is less supportive	Students are asked to look for a better signal
2.	Limited student data plan availability	The government through the Ministry of Education and Culture provides a data package for distance learning / online learning
3.	Unable to carry out real laboratories for dynamic electric materials	***there is no solution yet***
4.	Teachers and students adapt to online learning tools (zoom meet, google classroom, etc.)	takes longer to adapt to be more familiar with the use of new technology

Based on the data in table 5, it can be analysed that some obstacles during online learning have been resolved with several solutions offered, but there is one thing that has not yet gotten a solution, namely real laboratory activities which cannot be implemented during the pandemic period because it has been since the beginning of the pandemic up to several months, learning in schools is closed by the government.

C. Student Response to Online Learning Implementation

The following shows the results of the student response questionnaire to online learning carried out:

Table 6. Results of Student Response Questionnaire Against Online Learning

CONTENT RESPONSE			
	How do you evaluate the content components?	interested	not interested
1	Material / lesson content	84%	16%
2	Video material provided	70%	30%
3	Handouts that are shared	64%	36%
4	The way teachers teach online	78%	22%
5	Online learning atmosphere	52%	48%
6	Teacher-directed stages in the online learning process	38%	63%
	average	64%	36%
TOOLS RESPONSE			
	Are you new to any of the following components?	New	not new
1	using zoom meet	88%	13%
2	using classroom	91%	9%
3	using whatsApp in learning	66%	34%
4	use Telegram for quizzes	94%	6%
5	do the questions online	66%	34%
	average	81%	19%
PROCESS RESPONSE			
	Are you having trouble with any of the following?	not difficult	difficult
1	Understand the concepts taught online	36%	64%
2	Linking one concept to another	53%	47%
3	Doing an online experiment	19%	81%
4	Understand the content of the Handout for students	50%	50%

5	Formulate problems, formulate predictions, determine variables, analyze data, make graphs and make conclusions	16%	84%
6	Doing questions online	75%	25%
7	Follow the learning that has been given	59%	41%
	average	44%	56%
total average		**63%**	

Based on the Table 6, it can be seen that 64% of students are interested in online learning content prepared by the teacher, 81% of students stated that they were new to the tools used in online learning, and 44% of students stated that they did not find it difficult in online learning. Overall learning that has been implemented has received positive responses / responses with a percentage of 63%.

In the following, the results of the questionnaire are stated in a chart which can be observed in Figure 1 (content response), Figure 2 (tools response), and Figure 3 (process response).

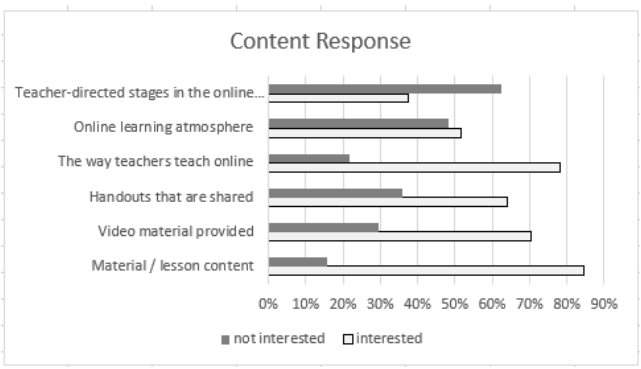

Figure 1. Content response

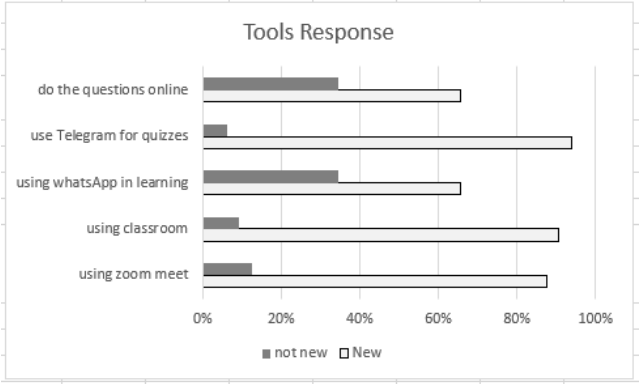

Figure 2. Tools response

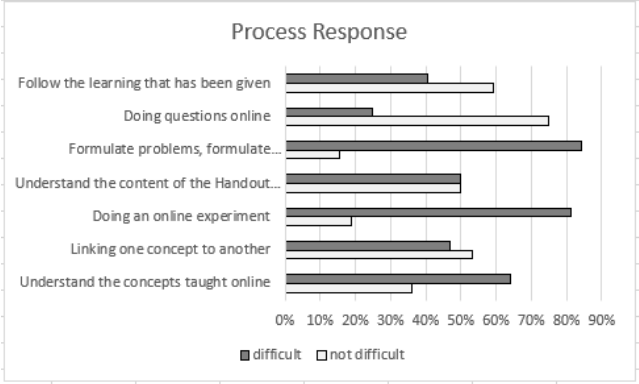

Figure 3. Process response

CONCLUSIONS

Based on the results of the data and analysis, it was found that the mean pre-test and post-test scores were still very low below the minimum standard. N-Gain analysis shows a value of 0.23 and is classified into the "low" category, while based on statistical analysis with SPSS 22 shows that the sample is normally distributed so that further hypothesis statistical analysis can be concluded that online learning has no effect on increasing student learning outcomes. In general, it can be concluded that online learning is not good enough to improve student learning outcomes on the topic of dynamic electricity, there is still a need for improvement in many ways including the facilities and infrastructure needed and adaptation to the technology used. It is necessary to rethink the replacement for real laboratories in schools to be implemented online so that students can still carry out laboratory activities even though they are online. Despite getting negative results, the online learning model is still one of the solutions that can be used in the current Covid-19 pandemic. It is hoped that furthermore there will be improvements to the online learning model used by teachers in schools both in terms of infrastructure and technology

ACKNOWLEDGMENT

Thanks, are given to the Ministry of Education and Culture of the Republic of Indonesia for providing research grants for beginner lecturers to the research team. Not to forget the highest award given to the Rector of the Islamic University of Lamongan through the head of the research and community service institute who has provided the opportunity for researchers to get this research grant.

REFERENCES

1. Belawati, Tian. 2019. *E-Book Online Learning*. Tangerang Selatan: Universitas Terbuka. e-ISBN: 978-602-392-703-6
2. Blaschke, Lisa Marie & Bedenlier, S. 2020. *Online Learning*. 10.1093/acrefore/9780190264093.013.674.
3. Martin, Florence & Polly, Drew & Ritzhaupt, Albert. 2020. *Bichronous Online Learning: Blending Asynchronous and Synchronous Online Learning*.
4. Taylor, J. 2000. *New millennium distance education* on *V. Reddy & S. Manjulika (Eds)*. The world of open and distance learning
5. Daniah, Daniah. 2020. *Pentingnya Inkuiri Ilmiah Pada Praktikum Dalam Pembelajaran IPA untuk Peningkatan Literasi Sains Mahasiswa*. PIONIR: JURNAL PENDIDIKAN. 9. 10.22373/pjp.v9i1.7178.
6. Khalifa, Hussein. (2020). *Designing for online learning*. 10.13140/RG.2.2.32130.09927.
7. Perusso, Andre & Diriba, Habtamu. (2020). *Online Learning Toolkit*. A practical and methodological guide for teachers & trainers to design and deliver online curricula & courses. Eleadership.
8. Kibuku, Rachael & Ochieng, Dan. 2018. *Formulating an e-learning theory: a grounded theory approach*. 1-5. 10.1145/3283458.3283492.
9. Holbeck, Rick & Hartman, Jillian. 2018. *Efficient Strategies for Maximizing Online Student Satisfaction: Applying Technologies to Increase Cognitive Presence, Social Presence, and Teaching Presence*. Journal of Educators Online. 15. 10.9743/jeo.2018.15.3.6.
10. Kusmaharti, Dian & Yustitia, Via. 2020. *Efektivitas Online Learning terhadap Kemampuan Pemecahan Masalah Matematika Mahasiswa*. Journal of Medives : Journal of Mathematics Education IKIP Veteran Semarang. 4. 311. 10.31331/medivesveteran.v4i2.1199.
11. Sugiyono. 2015. *Metode Penelitian Pendidikan (Pendekatan Kuantitatif, Kualitatif, dan R&D)*. Bandung: Alfabeta.
12. Sesmiyanti, Sesmiyanti & Antika, Rindilla & Suharni, Suharni. (2019). N-Gain Algorithm for Analysis of Basic Reading. 10.4108/eai.19-7-2019.2289527.
13. Hake, Richard. (2002). *Relationship of Individual Student Normalized Learning Gains in Mechanics with Gender, High-School Physics, and Pretest Scores on Mathematics and Spatial Visualization*. Indiana University (Emeritus), 24245 Hatteras Street, Woodland Hills, CA 91367
14. Didik Setyawarno. 2019. *Panduan Statistik Terapan Untuk Penelitian Pendidikan*. Pendidikan IPA UNY
15. Beaver, Margaret. 2014. *SPSS 22 for Windows SPSS 22 for Windows TUTORIAL Cross-Sectional Analysis Short Course Training Materials Designing Policy Relevant Research and Data Processing and Analysis with SPSS 22 for Windows** 1 st Edition.
16. Kim, So & Baek, Jong. 2016. *FUZZY matching using propensity score: IBM SPSS 22 Ver*. Journal of the Korean Data and Information Science Society. 27. 91-100. 10.7465/jkdi.2016.27.1.91.
17. Joosten, Tanya & Cusatis, Rachel. 2020. *Online Learning Readiness*. American Journal of Distance Education. 34. 1-14. 10.1080/08923647.2020.1726167.