

PROJECT-BASED ONLINE LEARNING EFFECTIVENESS IN IMPROVING THE SKILLS OF ADDRESSING CONTEXTUAL PROBLEMS IN THE COVID-19 Pandemic

Rika Nora¹, Helmy Fitriawan², Dwi Yulianti³

¹Magister of Educational Technology, University of Lampung, Indonesia

²Departement of Electrical Engineering, University of Lampung, Indonesia

³Departement of Teacher Training and Education, University of Lampung, Indonesia

Abstract: *The online learning model carried out by educators has been less varied so that students feel boredom. Often the subject matter and assignments submitted by educators only focus on the realm of knowledge. Meanwhile, the realm of skills with a project-based learning model has not been developed. Therefore, this study aims to determine the effectiveness of the application of a project-based learning model for geometry transformation material in online learning during the Covid-19 pandemic. The research and development uses the Borg and Gall model. The subjects of the trial were students of class IX at SMPN 32 Bandar Lampung, which amounted to 77 students. The data collection techniques used questionnaires, interviews, observations and tests. The results of the data analysis showed that the normalized N-Gain in the field test is 0.61, with moderate effectiveness qualifications. This shows that the application of the Project Based Learning model is effectively used in online learning.*

Keywords : *Online learning, Project Based Learning*

I. INTRODUCTION

The Covid-19 pandemic has changed the order of life in various fields, including in the field of education. Since the announcement of the policy to close all educational institutions by the Indonesian government. Millions of students are now no longer able to study at school. This was done to prevent the spread of the corona virus from spreading. However, learning should not stop under any conditions. As an alternative to learning, educators are forced to be able to change their learning according to the situation and conditions that occur. Schools implement online learning. Students are forced to study from home (BDR) and teachers work from home.

The change in the learning system from face-to-face to online learning was suddenly felt by educators, especially before educators had never done online learning. In addition, educators must adjust the learning they do both subject matter, models and suitable media so that online learning can run well. Educators are also required to have the ability to operate online learning technology tools such as google school, zoom meetings, google meet and also create google forms, google slides. In the midst of limited infrastructure and limited ability to use technology, educators are forced to learn and upgrade themselves, but the fact is that not all educators can have such competences.

Similar conditions the researchers encountered at SMPN 32 Bandar Lampung, mathematics learning activities carried out online seemed monotonous and less varied so that students experienced boredom. Mathematics learning activities emphasize the aspects of knowledge only and the delivery of material also theoretically. Contextual education that involves real problems that exist around students has not been carried out. Students are often given assignments that do not address contextual problems in their lives. According to Mohammad Faizal Amir (2015) if in mathematics learning students are given real problems around their lives through contextual learning, then students will try to connect and construct a theoretical or abstract understanding of concepts according to the nature of mathematics and experiences they have had before.

In terms of infrastructure, there are also many obstacles, both for students and for educators. This can be seen in the online learning conducted at SMPN 32 Bandar Lampung. The learning is still not optimal. Preliminary study data shows that 95% of students already have cellular phones, this condition is of course very supportive of online learning. And only 5% or 13 educator participants still borrow from their parents. However, when viewed from the type of internet network, only 11% have used wifi, while the majority, namely 89% of educator participants, are still dependent on the presence or absence of an Internet quota package. Meanwhile, the economic conditions of the parents of students are mostly middle to low and in addition have been affected by Covid. So that the absence of this quota package is often the biggest reason students cannot join online classes other than not being used to doing online learning.

This is in line with research conducted by Zainal Abidin (2020), which reveals that the main obstacles that most often arise during the implementation of online learning are internet packages that are not owned by students, limited internet access by educators and students, and are not familiar with online learning. And the results of the survey by Gunawan et al (2020) There are several obstacles faced when doing online learning, especially internet access (data packages) and it is not customary for educators and students to use online learning applications.

The government is responsive in overcoming this condition by issuing an Education Policy during the Covid-19 pandemic emergency. In addition to adjusting the Curriculum, which is to streamline and cut some Basic Competencies and focus on essential materials only. The government also issued a Circular of the Minister of Education and Culture No.4 of 2020. These policies include: learning from home through online learning should be varied, providing meaningful experiences for students but with only essential material coverage without burdening students. As with simple project activities that students can do at home. This certainly makes it easier and provides direction for teachers to carry out online learning.

Project-based learning is an in-depth investigation of a topic from the real world. Project-based learning models are an alternative learning model that can activate students in supporting their life skills (Sucilestari, 2018). Furthermore, Zainal Abidin emphasized that online learning would certainly be less meaningful without the synergy of proper learning strategies and methods and the application of project-based learning is one of the right models in online learning. Meanwhile, Milhatul Hikmah (2020) states that through the application of the Project Based Learning model, learning can take place conducive, this is indicated by the positive response of students to learning and the progress of learning outcomes.

Therefore this article will discuss the development of project-based learning to improve students' skills in solving contextual problems during a pandemic. Basic Competence which is the field of research is KD 4.5 in the odd semester of class IX SMP, which discusses Geometry Transformation.

In this case, the researcher made use of the typical cultural art work of Lampung Province, namely the filter cloth, as a means of teaching the concept of geometric transformation. Because in the filter cloth motifs, there are mathematical concepts, namely the concept of geometric transformation that can be learned by students.

II. RESEARCH METHOD

The development model in this study refers to the Borg & Gall model, but is limited to the 7th step. As for the development of learning using the ASSURE development model.

The type of data in this research is in the form of qualitative and quantitative data, including initial data to analyze needs, evaluation data from experts and data on learning outcomes in the form of pretest and posttest. The instruments used in R&D were formulated to obtain the following data: 1. Condition and Potential of SMPN 32 Bandar Lampung : Data regarding the condition and potential of SMPN 32 Bandar Lampung, obtained by direct observation to the location of the study, interviewing several mathematics teachers and requesting the necessary documents. 2. Product Design: To get data about product design, researchers will ask for expert opinion or expert validation. By giving questionnaires to media experts, learning design experts and material experts. The questionnaire has previously been consulted with the supervisor. 3. Effectiveness : Data regarding the effectiveness of project-based online learning of geometry transformation material in this study were obtained by giving pretest and posttest questions to students. Before the questions are used, they have received expert validation

Pretest and posttest value data on geometric transformation material to measure the effectiveness of learning. However, before that, the normality of the data is tested first, with the Chi Square formula. The goal is to find out whether the data to be analyzed is normally distributed or not. A data that is normally distributed if the amount of data above and below the average is the same, so is the standard deviation. Furthermore, testing the effectiveness, is done by comparing the results of the pretest and posttest which are then tested using the Normalized Gain formula. The normalized average gain is obtained from the difference between the average post-test score and the pretest average score

III. RESULTS AND DISCUSSION

3.1 Condition and Potential

Based on observations of the conditions and potential of students, in terms of general characteristics such as age, gender, socioeconomic level and ethnicity / culture, it shows homogeneous characteristics. While observations of specific characteristics such as learning styles and cognitive abilities show homogeneous results that can be seen from the results of the students' pretest / initial abilities.

Table 3.1 Identification of Student Characteristics

Class	Number of Students	Age Range (Years)	Social & economic	Culture & tribe	Pretest Value (scale 100)	Learning Style
IX 6	32	14 – 15	Middle down	diverse	10-60	diverse
IX 7	32	14 – 15	Middle down	diverse	10-60	diverse
IX 8	26	14 – 15	Middle down	diverse	10-60	diverse

Based on Table 3.1, it is known that the background of students who are the subject of the trial has homogeneous characteristics, both from the age range, socioeconomic, ethnic / cultural, learning style and level of cognition.

Based on the results of interviews with classmates and teachers, the researcher obtained data that from 77 students or 100% of students already had a cellular phone with an internet network type 2.1% used wifi, and 97.9%, used a quota, as in Figure 3.1.

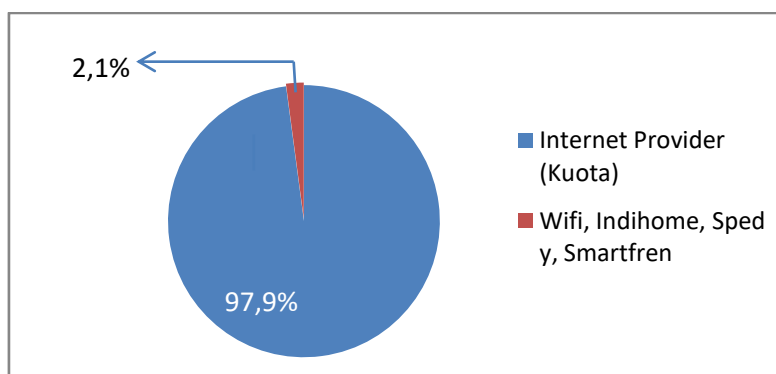


Fig. 3.1 Types of Internet Networks Used

From the data above, it shows that the conditions and potential of schools support the research

3.2 Effectiveness Test Results

To determine the effectiveness of learning, the pre-test and post-test of the geometry transformation material were carried out. The results of the difference in pretest and posttest values as a basis for determining the effectiveness of the product, by comparing the N-Gain obtained with the N-Gain in the Chi Square value table.

In the data collection of the pretest and posttest scores, the questions were distributed to the three classes which were the research subjects with the number of class IX students.6 as many as 28 people, class IX.7 consisted of 26 people and class IX.8 consisted of 23 people. Data recapitulation of the 77 students' pretest and posttest scores who became respondents can be seen in Table 3.2.

Table 3.2 Recapitulation of Effectiveness in Field Testing

Class	Average value		Enhancement	N-Gain
	Pretest	Posttest		
IX. 6	37,86	75,36	37,50	0,61
IX. 7	36,54	75	38,46	0,62

IX. 8	35,65	74,78	39,13	0,61
Average	36,68	75,04	38,36	0,61

Data from Table 3.2 obtained an average normalized N-Gain of 0.61, this value is greater than 0.5, which means that the normalized N-Gain is in the moderate category. Therefore, it can be described that the application of project-based distance learning is effective, improving the skills of students in solving contextual problems in geometric transformation material.

However, researchers must state that the quality of the results of this distance learning cannot be compared with the quality of face-to-face learning. Because in this learning the researcher only delivers essential material or basic material. There has been a decline in curriculum standards, by simplifying the target competency achievement. As with the policies and strategies promoted by the Ministry of Education and Culture in an effort to enforce teaching and learning activities during the pandemic.

During carrying out the research there were several obstacles that were found, and the researcher tried to overcome them with several treatments, such as:

1. Limited internet quota and even no quota. This is the reason most students do not respond to learning. The Indonesian government has tried to overcome this obstacle by providing free internet quota for 2 months. But not all students can get it. Still, students have to buy their own. Therefore, educators need to choose tasks that are light and do not take up large quotas. And understand if there is a delay in sending assignments or participants are temporarily off because there is no quota.
2. Independent learning and time management. Students are not accustomed to learning online, which demands independent learning and the ability to manage time causing students to lack discipline. Plus online games, tick-tock, face books, etc., which often neglect students. Therefore, teacher guidance and supervision are needed and involve the role of parents with children with problems.

IV. CONCLUSION

The initial conditions and potential of the school, namely SMPN 32 Bandar Lampung, support the development of online learning with a project-based learning model. The results of the test of the effectiveness of the application of project-based online learning show the moderate or effective category. This is supported by data analysis which shows an increase in the average posttest score against the average pretest score after learning. This learning model is not the only determinant of learning success, many other variables influence it such as a decrease in the standard of competency achievement from basic competencies. The rarity of this project-based learning model used by educators causes students not to get used to organizing a project. Therefore, assistance and monitoring are needed. Educators must be patient and painstaking in explaining and answering students' questions and not getting bored giving motivation so that the learning objectives are achieved.

REFERENCES

- [1] Abidin, Zainal; Rumansyah dan Kurniawan Arizona. 2020. Pembelajaran Online Berbasis Proyek Salah Satu Solusi Kegiatan Belajar Mengajar Di Tengah Pandemi Covid-19. *Jurnal Ilmiah Profesi Pendidikan*. Vol. 5, No. 1, hal 64-70
- [2] Gunawan, Suranti, NMY. & Fathoroni. 2020. *Variations of Models and Learning Platforms for Prospective Teachers During the COVID-19 Pandemic Period*. Indonesian Journal of Teacher Education. Vol. 1. No. 2. hlm. 61-70.
- [3] Hikmah, Miftahul. 2020. Penerapan Model Project Based Learning Untuk Meningkatkan Partisipasi Dan Hasil Belajar Pemrograman Dasar Siswa SMK. *Jurnal Teknodik*. Vol. 24 No. 1
- [4] Hake, R. R. 1999. *Analyzing Change/Gain Scores. AREA-D American Education Research Association's Devision. D, Measurement and Research Methodology*.
- [5] Hardiyana, Andri. 2015. *Implementasi Google Classroom sebagai Alternatif dalam Meningkatkan Mutu Pembelajaran di Sekolah*. Karya Tulis Ilmiah, Cirebon: SMA Negeri 1 Losari.
- [6] Hermeliyati, Pitri. 2016. *Pengembangan Lembar Kerja Peserta Didik Pada Materi Program Linier Dengan Model Pembelajaran Berbasis Masalah*. (Tesis). Universitas Lampung. Bandar Lampung. 58 hlm
- [7] Johnson, E.B. 2007. *Contextual Teaching & Learning: Menjadikan Kegiatan Belajar-Mengajar Mengasikkan dan Bermakna*. Mizan Media Utama, Bandung.
- [8] Muslimah, Mega. 2018. *Pengembangan Buku Saku Geometri Transformasi Dengan Motif Batik Nusantara*. (skripsi). Universitas Islam Negeri Raden Intan Lampung. Bandar Lampung. 110 hlm.

- [9] Sarbiyanti, Umyum. 2018. *Pengembangan Modul Pembelajaran Prakarya Berbasis Project Based Learning Materi Kerajinan Serat dan Tekstil Untuk Meningkatkan Hasil Belajar Peserta Didik Kelas VII*. (Tesis). Universitas Lampung. Bandar Lampung, 405 hlm
- [10] Setyosari, P. 2007. Pembelajaran Sistem Online: Tantangan dan Rangsangan. *Majalah Ilmiah Pembelajaran Jurnal UNY 2*, hlm. 1-10.
- [11] Sharon, E. Smaldino, dkk. *Instructional Technology & Media For Learning*. Kencana, Jakarta..
- [12] Slavin, Roberts. 2000. *Educational Psychology: Theory and Practice*. New Jersey: Pearson Education
- [13] Sugiyono. 2016. *Metode Penelitian & Pengembangan Research and Development*. Alfabeta, Bandung.
- [14] Windria, Hening. 2016. *Batik Kaya Matematika: memanfaatkan Motif Batik dalam Kelas Matematika Volume 1*, Prosiding Seminar Nasional Pendidikan Matematika. hlm. 279-291.
- [15] Umbara, Uba, 2017. *Implikasi Teori Belajar Konstruktivisme Dalam Pembelajaran Matematika*. *Jurnal Jumlah (Jurnal Matematika Ilmiah)* Vol.3, No. 1. hlm. 31-38.