ICOE 2024
Hybrid Conference
International Conference on Education 2024

PROCEEDINGS 2024
The 2nd International Conference on Education
E-ISSN: 3025-6828
Volume 02, Tahun 2024

Effectiveness of Video-Assisted Project Based Learning (PjBL) Model in Improving Student Learning Outcomes

Yulianti Yusal[1]; Ummiy Fauziah Laili[2]; Ibrahim Bin Sa'id[3]; Eva Alvi Nurlaili[4]; Meirita Sari[5]
[1]Institut Agama Islam Negeri Kediri; [2]Institut Agama Islam Negeri Kediri;
[3]Institut Agama Islam Negeri Kediri; [4]Institut Agama Islam Negeri Kediri;
[5]Universitas Islam Negeri Fatmawati Sukarno Bengkulu
Correspondence e-mail: yuliantiyusal@iainkediri.ac.id

Abstract:
The purpose of this study was to determine whether there is a significant difference between the learning outcomes of students taught using the video-based *Project Based Learning* model and students taught using conventional learning. This research used *quasi-experimental* method with *Posttest Only Control Design* research design. The research was conducted at MTs Al-Manar using two classes as samples, the two classes were class IX C as the experimental class and class IX D as the control class. The instruments used in this study are learning outcomes test questions, learning outcomes questionnaires and learning implementation observation sheets. Data analysis used descriptive statistical analysis and inferential statistical analysis. The results of descriptive statistical analysis showed that the average score in the control class was 75.65, while the average in the experimental class was 82.21. Inferential statistical analysis was carried out by means of t-test (*independent sample T-Test* test). Based on the results of the *Independent Sample T-Test* test, the *sig (2-tailed)* value is 0.001, meaning that sig <0.05 so that H0 is rejected and H1 is accepted. From the results of these calculations, the researcher concluded that there was a significant difference between the learning outcomes of ninth grade students of MTs Al-Manar who were taught using a video-based *Project Based Learning* model and students who were taught using conventional learning.

Keywords: *video, project based learning, learning outcome*

Articl e History:
Received : 15 August 2024
Revised : 07 October 2024
Accepted : 25 October 2024
**editors will fill up the article history*

Introduction

Natural Science (IPA) is a subject that studies ourselves and the surrounding nature. Science subjects emphasize the provision of hands-on learning experiences, through the use and development of process skills and scientific attitudes (Anjarsari, Suyatna, and Viyanti 2023). Through science subjects at school, students are expected to have knowledge and insight into the science of science and work skills (projects), have sensitivity and awareness of problems in the environment. "With science learning is expected to foster scientific attitudes" (Bergman 2016). Scientific attitudes that students must have, namely an attitude of curiosity, confidence, honesty, unhurried, and objective to the facts.

From the information obtained from the science class teacher, that in the learning process carried out online there are still many obstacles faced, including student learning outcomes that are not optimal. This has several reasons, namely because (1) the teacher does not use learning media, so that students pay less attention during the learning process (2) students are less interested in learning that is only menotonous, (3) the teacher only gives assignments, so students become uncreative.

The existence of these problems causes the need for an improvement effort or action to overcome these problems. One of the efforts that can be made to improve learning outcomes is to use a learning model. Learning models that have characteristics provide opportunities for students to build knowledge based on real experiences, so that they can improve their learning outcomes (Lotulung, Ibrahim, and Tumurang 2018). This study aims to increase the completeness of student learning outcomes above 90%. The reason for applying the *project-based* learning model assisted by learning video media is because the *project-based learning* model can make it easier for students to accommodate and build their own knowledge. "The *project-based learning* model learning model includes *problem solving* activities*,* decision making, investigation skills, and work making skills"(Lestari, Sarwi, and Sumarti 2018). And the use of learning video media can help students to increase learning activities and science learning outcomes (Panjaitan et al. 2023).

The theoretical basis for this research is Constructivism Learning Theory, this constructivism theory states that learners must find their own and transform complex information, check new information with rules that are no longer appropriate (Pradhita Yudhi Astri, Gunarhadi, and Riyadi 2018). For learners to understand and apply knowledge, learners must work to solve problems, find everything for themselves, try hard with ideas. This theory develops from the work of Piaget, Vygotsky, information processing theories, and other cognitive psychology theories, such as Bruner's theory(Afif 2023). This theory is used in implementing the use of *Project Based Learning* Model in science learning, because with this theory the teacher will be able to help students to form their ownknowledge from the ideas they already have with ideas that come from outside themselves and a person's knowledge is the form or construction of that person(Tamim and Grant 2013).

Based on the above background, it is necessary to conduct research on video-based *Project Based Learning* in improving learning outcomes. The purpose of this study is to determine whether video- based *Project Based Learning* can improve student learning outcomes.

Methods

This study used a *quasi-experimental* research method with a *Postest Only Control Design* research design (Sugiyono 2020). An overview of the research design implemented is presented in Table 1.

Table 1. Research design

Class	Treatment	Posttest
Experiment	XE	O1
Control	XP	O2

Based on Table 1, it can be seen that XE is the learning treatment with the video-based *Project Based Learning* model, XP is the learning treatment with the conventional model, O1 is the *posttest of* learning outcomes in the experimental class, O_2 is the *posttest of* learning outcomes in the control class.

The population in this study were all 9th grade students of Mts Al-manar. While the sample was taken using *purposive sampling* technique. In this study using two classes as samples, the two classes are class IX C as an experimental class that will get learning with a video-based *Project Based Learning* model, and class IX D as a control class that will get a conventional learning model. The number of students in the experimental class was 34 people and the control class was 34 people. Class IX was chosen because it was adjusted to the solar system material in the science curriculum.

The instruments used in this study include learning outcomes test questions and observation sheets of learning implementation. The learning outcome instrument in the cognitive domain consists of 20 multiple choice questions with indicators C1 (knowledge), C2 (understanding), C3 (application), and C4 (analysis)(Retno Utari 1942) .

In this study, two data analysis techniques were used, namely descriptive statistical analysis and inferential statistical analysis. Descriptive statistical analysis was used to determine the average value in each class. Inferential statistical analysis is used to determine whether there is a significant difference between student learning outcomes in experimental and control classes. Before inferential statistical analysis is carried out, the data must go through a prerequisite test which includes normality test and homogeneity test.

Results and Discussion

Descriptive Statistical Analysis Results

The following are the results of descriptive statistical analysis of the data that researchers have obtained.

Table 2. Descriptive Statistics of Student Learning Outcomes of Experimental Class and Control Class

	Class	Control Class
Mean	82.21	75.65
Std. Deviation	6,413	6,175
Variance	41,123	38,133
Minimum	69	62

Maximum	95	88

From Table 2 above, it can be seen that the learning outcomes of students in class IX Mts Al-manar in the experimental class obtained an average of 82.21 , a standard deviation of 6.413, had a minimum score of 68 and a maximum score of 95. While the control class obtained an average of 75.65, a standard deviation of 6.175, had a minimum score of 62 and a maximum score of 88.

The results of student learning outcomes in the experimental class and control class if categorized based on the categorization proposed then a frequency distribution table can be made as follows Table 3 (Merchant et al. 2014).

Table 3. Percentage Results of Achievement of Student Learning Outcomes Experiment

Learning Outcome Score Range	Category	Frequency	Percentage (%)
>80	Good Once	24	70,59
70 - 79	Good	9	26,47
60 - 69	Simply	1	2,94
50 - 59	Less	0	0
<50	Less Once	0	0

From Table 3, it can be seen that in the experimental class 70.59% were in the excellent category, 26.47% were in the good category, and 2.94% were in the sufficient category.

Table 4. Results of the Percentage of Achievement of Student Learning Outcomes in the Control Class

Learning Outcome Score Range	Category	Frequency	Percentage (%)
>80	Good Once	16	47,06
70 - 79	Good	15	44,12
60 - 69	Simply	3	8,82
50 - 59	Less	0	0
<50	Less Once	0	0

From Table 4, it can be seen that in the control class 47.06% were in the excellent category, 44.12% were in the good category, and 8.82% were in the sufficient category.

Results of Inferential Statistical Analysis

1) Prerequisite Test Analysis

The purpose of inferential statistical analysis is to test the truth of the hypothesis that has been proposed in the study. Before the data obtained through the hypothesis testing stage, the data must go through the prerequisite test first. The prerequisite tests include normality test and homogeneity test.

The Kolmogorov-Smirnov formula using the IBM SPSS *Statistics 24 for windows* application was used by researchers to test the normality of *posttest* scores in experimental and control classes. The following is a table of data normality test results.

Table 5. Normality Test Results

Class	Statistic	df	Sig.
Experimental class	0,110	34	0,200
Control class	0,124	34	0,200

Based on Table 5, it is known that the posttest data in the experimental and control classes are normally distributed with a significance level, namely sig ≥ 0.05 of 0.200. The homogeneity test of posttest scores in the experimental group and control group was carried out by researchers using the IBM SPSS Statistics 24 for windows application. The following is a table of data homogeneity test results.

Table 6: Homogeneity Test Results

Levene Statistic	df1	df2	Sig.
0,031	1	66	0,860

Based on Table 6, it is known that the posttest value data in the experimental class and control class are homogeneously distributed with a significance level of sig ≥ 0.05 of 0.860.

2) Research Hypothesis Testing

Based on the results of the prerequisite test that has been carried out, it can be seen that the posttest data of the student learning outcomes test in the experimental class and control class are normally distributed and homogeneous. Therefore, the data can go through the next stage, namely hypothesis testing analysis. The hypotheses in this study are, H0 states that there is no significant difference between the learning outcomes of grade IX Mts Al-manar students taught using the video-based Project Based Learning model and students taught using conventional models, H1 states that there is a significant difference between the learning outcomes of grade IX Mts Al-manar students taught using the video-based Project Based Learning model and students taught using conventional models.

Hypothesis testing using the Independent Sample T-Test test. The Independent Sample T-Test test was conducted on posttest data in the experimental class and control class which was calculated using the IBM SPSS Statistics 24 for windows application which can be seen in the following table.

Table 7. *Independent Sample* T-test Results

	t	df	Sig. (2-tailed tailed
Equal variances assumed	3,371	66	0,001
Equal variances not assumed	3,371	65,906	0,001

From the results of the Independent Sample T-Test test in Table 7, the sig value is obtained. (2-tailed) <0.05 of 0.001, then H0 is rejected and H1 is accepted. From these results, it can be concluded that there is a significant difference between the learning outcomes of grade IX Mts Al- manar students taught using the video-based Project Based Learning model and students taught using the conventional model.

The learning outcomes of students taught using the video-based Project Based Learning model showed a higher difference compared to the control class taught using conventional learning. The average difference is shown from the higher experimental class learning outcomes which obtained an average of 83.71 while the control class obtained an average of 78.56. From the results of the Independent Sample T-Test test also get a sig value. (2-tailed) <0.05 at 0.001 so accept H1 which states that there is a significant difference between the learning outcomes of grade IX Mts Al-manar students taught using the video-based Project Based Learning model and students taught using conventional learning. These results are in line with the results of research from (Pangkey et al. 2023) which states that the application of the Project Based Learning model can improve student learning outcomes.

In the application of the Project Based Learning model, there are five phases, namely, the phase of determining the fundamental question or determining the project, the phase of designing product planning, the phase of preparing a project implementation schedule, the phase of monitoring project activeness and progress, the phase of testing the project and evaluating the learning experience.

In the phase of determining the fundamental question or determining the project. The teacher shows a video that contains an explanation of the solar system. This is done so that students can improve their solar system competency. Video viewing provides a strong competency base on the concept of the solar system. In line with (Çakir, Üniversitesi, and Fakültesi 2006) which states that learning videos can convey complex or abstract material in a way that is easier to understand.

After viewing the video, students are faced with problems through the solar system video display. This is done so that students can increase their solar system knowledge. By viewing videos about the solar system, students become more aware of solar system material. This visual experience triggers curiosity which encourages students to explore more about the problem. They begin to ask critical questions, seek additional information, and develop a more comprehensive understanding of the solar system. This is in line with the opinion of (Branch 2004) which states that confronting students directly with can encourage students to explore more deeply about the problem.

In the second phase, designing a product plan, the teacher invites students to plan a project that can overcome the solar system problems shown in the previous phase. After the project is determined, students are asked to make a project design. Through this phase, students learn to choose effective ways to address pollution and design strategies to solve the problem of solar system. Through this stage, students can improve their solar system knowledge and competence. This is in line with the opinion of (van Merriënboer, Jelsma, and Paas 1992) which states that the planning and design process is very important because it involves various cognitive and practical skills. In this process, students develop a deeper understanding of the material they are learning.

In the third phase, which is developing a project schedule, students under the guidance of the teacher make an agreement on the time to complete the product or project to be made. Through this phase, students learn to plan and organize the actions needed to address the problem. The process of creating a schedule helps students develop time management skills that are critical to completing the project effectively and efficiently. At this stage, students can improve their solar system knowledge. In line with the opinion of (Agranovich et al. 2019) which states that through the schedule preparation stage helps students develop time management skills and planning the actions needed to overcome a problem.

The fourth phase is monitoring the project's activity and progress. In this phase, students begin to carry out concrete actions to overcome the problems that are happening through making projects or products. In this study, the product that students made was a solar system media. Through this stage, students not only apply their theoretical knowledge, but are also directly involved.

The fifth phase is testing the project and evaluating the learning experience. In this phase, students test the project and make a report on the results of making the project. Through the report, students recall all the steps they have taken during the project. This process helps students reflect on their learning experience, identifying what worked and what needs improvement. This reflection is very important as it helps students realize their strengths and weaknesses in managing the project, as well as improve their understanding of the solar system concepts applied (Henze, van Driel, and Verloop 2008). So that through this stage, students can improve the competence of their learning outcomes. This is in line with the statement from (Karpicke and Blunt 2011) which states that through making reports, students can recall their understanding of the concepts and practices that have been applied.

Conclusion

The results of the student learning outcomes test in the experimental class which was given the treatment of the *Project Based Learning* model assisted by video learning got an average of 82.21 in the excellent category. While the test results of student learning outcomes in the control class given the treatment an get an average of 75.65 is in the good category.

From the results of the *Independent Sample T-Test* test, the *sig* value is obtained*. (2- tailed)* <0.05 amounting to 0.001, then H0 is rejected and H1 is accepted. From these results, it can be concluded that there is a significant difference between the learning outcomes of grade IX Mts Al-manar students taught using the *Project Based*

e-ISSN 3025-6828

Learning model assisted by learning videos and students taught using conventional learning.

References

Afif, Nur. 2023. "The Model of Scientific Learning with Bruner , Piaget and Vigotsky ' s Theory Approach at Elementary Madrasah Schools in Banten." *Edukasi Islami: Jurnal Pendidikan Islam* 12(2):1963–78. doi: 10.30868/ei.v12i02.4499.

Agranovich, Yelena, Amina Amirova, Larissa Ageyeva, Larissa Lebedeva, Sholpan Aldibekova, and Elmira Uaidullakyzy. 2019. "The Formation of Self-Organizational Skills of Student's Academic Activity on the Basis of 'time Management' Technology." *International Journal of Emerging Technologies in Learning* 14(22):95–110. doi: 10.3991/ijet.v14i22.11755.

Anjarsari, Cerli, Agus Suyatna, and Viyanti. 2023. "Comparison of Cognitive Learning Outcomes and Students' Science Process Skills Between Hands on Practicum and Virtual Laboratory Based on PhET Simulation Viewed from Students' Learning Style." *Jurnal Penelitian Pendidikan IPA* 9(11):9524–31. doi: 10.29303/jppipa.v9i11.4065.

Bergman, Brenda Gail. 2016. "Assessing Impacts of Locally Designed Environmental Education Projects on Students' Environmental Attitudes, Awareness, and Intention to Act." *Environmental Education Research* 22(4):480–503. doi: 10.1080/13504622.2014.999225.

Branch, Robert Maribe. 2004. "Problem-Based Learning: What and How Do Students Learn?" *Educational Psychology Review* 16(3):235–66.

Çakir, İsmail, Kırıkkale Üniversitesi, and Eğitim Fakültesi. 2006. "The Use of Video As an Audio-Visual Material in Foreign Language Teaching Classroom." *The Turkish Online Journal of Educational Technology – TOJET October* 5(4):1303–6521.

Henze, Ineke, Jan H. van Driel, and Nico Verloop. 2008. "Development of Experienced Science Teachers' Pedagogical Content Knowledge of Models of the Solar System and the Universe." *International Journal of Science Education* 30(10):1321–42. doi: 10.1080/09500690802187017.

Karpicke, Jeffrey D., and Janell R. Blunt. 2011. "Retrieval Practice Produces More Learning than Elaborative Studying with Concept Mapping." *Science* 331(6018):772–75. doi: 10.1126/science.1199327.

Lestari, Tri Puji, Sarwi Sarwi, and Sri Susilogati Sumarti. 2018. "STEM-Based Project Based Learning Model to Increase Science Process and Creative Thinking Skills of 5th Grade." *Journal of Primary Education* 7(1):18–24.

Lotulung, Chrisant Florence, Nurdin Ibrahim, and Hetty Tumurang. 2018. "Effectiveness of Learning Method Contextual Teaching Learning (CTL) for Increasing Learning Outcomes of Entrepreneurship Education." *Turkish Online Journal of Educational Technology - TOJET* 17(3):37–46.

Merchant, Zahira, Ernest T. Goetz, Lauren Cifuentes, Wendy Keeney-Kennicutt, and Trina J. Davis. 2014. "Effectiveness of Virtual Reality-Based Instruction on Students' Learning Outcomes in K-12 and Higher Education: A Meta-Analysis." *Computers and Education* 70:29–40. doi: 10.1016/j.compedu.2013.07.033.

van Merriënboer, Jeroen J. G., Otto Jelsma, and Fred G. W. C. Paas. 1992. "Training for

Reflective Expertise: A Four-Component Instructional Design Model for Complex Cognitive Skills." *Educational Technology Research and Development* 40(2):23–43. doi: 10.1007/BF02297047.

Pangkey, Celline, Jeffry Lengkong, Mozes Legi, and Widdy H. F. Rorimpandey. 2023. "Application of the Project-Based Learning Model To Improve Indonesian Language Learning Outcomes for Class V Elemntary School Students." *Journal of Educational Learning and Innovation (ELIa)* 3(2):303–17. doi: 10.46229/elia.v3i2.724.

Panjaitan, Muktar Bahruddin, Mashudi Alamsyah, Martua Ferry Siburian, Endang Fatmawati, Uslan Uslan, and Gunaria Siagian. 2023. "Improving Students' Learning Outcomes in Natural Science Subject for Third Grade of Elementary School Through Video Media." *Jurnal Obsesi : Jurnal Pendidikan Anak Usia Dini* 7(3):3253–66. doi: 10.31004/obsesi.v7i3.4632.

Pradhita Yudhi Astri, Tantri, Gunarhadi Gunarhadi, and Riyadi Riyadi. 2018. "Numbered-Board Quiz with TGT to Improve Students' Science Achievement Based on Learning Motivation." *International Journal of Educational Research Review* 3(4):68–76. doi: 10.24331/ijere.452982.

Retno Utari. 1942. "Taksonomi Bloom." 1–13.

Sugiyono. 2020. *Metode Penelitian Dan Pengembangan (Research And Devolep-Ment/R&D)*. Bandung: Alfabeta.

Tamim, Suha R., and Michael M. Grant. 2013. "Definitions and Uses: Case Study of Teachers Implementing Project-Based Learning." *Interdisciplinary Journal of Problem-Based Learning* 7(2):5–16. doi: 10.7771/1541-5015.1323.