



The Effectiveness of Project-Based Learning (PjBL) Implementation Using Video Media on Student Motivation and Learning Outcomes

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Abstract: This research was motivated by low student motivation and learning outcomes in the Culinary Basics course at SMKN 6 Padang. Conventional learning models such as lectures and PowerPoint presentations are considered incapable of generating student enthusiasm and engagement in practice-based learning. The purpose of this study was to determine the effectiveness of implementing the Project-Based Learning (PjBL) model combined with video media in improving student motivation and learning outcomes in this subject. This study used a quantitative approach with a quasi-experimental design using a pretest-posttest control group design. Data collection used two main instruments: a learning outcome test to measure cognitive and psychomotor aspects, and a learning motivation questionnaire to measure students' affective factors. These instruments were tested for validity and reliability before use. Data were collected from two classes: an experimental class using PjBL with video media and a control class using the lecture method with PowerPoint. The results of data analysis showed a significant difference between the experimental and control classes. Students learning using the video-assisted PjBL model showed greater improvements in learning motivation and learning outcomes. The significance value obtained from the statistical test was below 0.05, indicating that the use of the video-based PjBL model was proven effective in improving the quality of culinary practical learning in vocational schools. Therefore, the implementation of video-assisted PjBL can be an innovative and engaging alternative learning strategy in vocational schools.

Keywords: Learning motivation; Learning outcomes; Project Based Learning; Video media

Introduction

Vocational High Schools (SMK) serve to train students in vocational skills so they are ready to work independently after graduation. Unlike senior high schools (SMA), SMKs include productive subjects that focus on work practice, aiming to prepare students with cognitive, affective, and psychomotor competencies relevant to industry standards (Anderson & Slotkin, 1975; Marliyah, 2024). SMKN 6 Padang, as one of the

Centers of Excellence, offers six vocational programs. Although the school has adopted the student-centered Independent Curriculum (Curriculum Merdeka), some teachers still employ conventional methods (Althubyani, 2024; Idoiaga et al., 2024). This approach often leaves students passive, unmotivated, and makes learning monotonous. This low learning motivation contributes to a lack of enthusiasm and engagement, which ultimately can lead to suboptimal learning outcomes (Dahri et al., 2024; Humairoh et al., 2024). The

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low learning outcomes at SMKN 6 Padang, particularly in culinary fundamentals, are caused by several factors, according to Ramadhani & Yulastri (2024). Teachers tend to use monotonous learning methods and do not connect the material to students' real-life experiences (Abdurrahmansyah et al., 2022; Saha et al., 2024).

Furthermore, students often simply memorize without understanding the relevant material. As a result, student learning outcomes, especially in the cognitive and psychomotor domains, remain below the minimum standards set by schools. This highlights the need for variations in learning models to improve student learning outcomes. The Project-Based Learning (PjBL) model is an innovative, project-centered method (Pratiwi & Ikhsan, 2024; Wulandari et al., 2024). Through this method, students collaborate to create a concrete project such as a design, model, or prototype. This approach allows students to explore their creativity and skills, thereby increasing motivation and learning outcomes (Ahrné et al., 2025; Gimenez-Escalante & Rahimifard, 2019). In addition to learning models, the use of video media is also important in education because it can capture students' attention (Adler et al., 2025; Trenholm & Marmolejo-Ramos, 2024). With its audio-visual format, video media is considered highly effective in conveying messages (Maulidiyanti & Muslim, 2023).

In culinary fundamentals courses, the use of video media significantly helps students understand complex food processing techniques and methods directly (Chen et al., 2022; Cok et al., 2022). This makes it easier for them to grasp the necessary steps and connect theory with real-world practice (Markula & Aksela, 2022; O'Neill & Short, 2025). The combination of the PjBL model and video media has proven effective in improving student understanding, motivation, and learning outcomes, as evidenced by several previous studies. Therefore, this study aims to measure the effectiveness of the implementation of Project Based Learning (PjBL) using video media on student motivation and learning outcomes in the culinary basics subject at SMKN 6 Padang.

Method

This research uses a quantitative approach with an experimental design using a quasi-experimental research method. This study employed a pretest-posttest control group design. In this design, two groups were randomly selected. One group was given treatment (X) (the experimental group), and the other was not (the control group). The research design is shown in the Table 1.

Table 1. Research Design

Pre-Test	Treatment	Post-Test
Q1	X1	Q2
Q3	X2	Q4

Pre-Test Treatment Post-Test

Q1 X1 Q2

Q3 X2 Q4

Description:

Q1: Pretest results from the experimental class

Q2: Posttest results from the experimental class

Q3: Pretest results from the control class

Q4: Posttest results from the control class

X1: Project Based Learning (PjBL) treatment using video media

X2: Lecture method treatment using Power

The two classes (experimental and control) were given the same pretest and posttest. The difference lies in the treatment given: The experimental class received treatment in the form of a Project Based Learning (PjBL) model with the aid of video media; The control class used conventional learning methods, namely lectures using PowerPoint. The study population was all students at SMKN 6 Padang taking the Culinary Basics course, which focuses on food processing techniques.

Table 2. Number of Grade 10 Culinary Students at SMKN 6 Padang

Class	Number of students	Average value	Description
X Culinary 1	35	74	= Sample
X Culinary 2	35	79	
X Culinary 3	35	79	
Total	105		

Results and Discussion

SMKN 6 Padang is an A-accredited vocational school established in 1994. Located at Jalan Suliki No. 1, Padang, this school is committed to producing work-ready graduates. SMKN 6 Padang offers various skill programs, including Culinary, which is the primary focus of this study. The school has also adopted learning innovations such as Project-Based Learning (PjBL) and digital technology integration, in line with the Independent Curriculum program. Supporting facilities such as a culinary kitchen, laboratories, and digital media play a crucial role in creating contextual learning.

Research Sample Description

This study involved 10th-grade students in the culinary skills program in the 2024/2025 academic year at SMKN 6 Padang. The sample consisted of two classes

with the same number of students (35 students) and equivalent academic characteristics: Experimental Class (Grade X Culinary 1): Consisting of 6 male students and 29 female students. This class implemented the PjBL learning model with video media for the Culinary Basics subject. Students were actively involved in designing and creating culinary practice videos as part of the project. Control Class (Grade X Culinary 3): Consisting of 7 male students and 28 female students. This class used conventional learning methods, namely lectures using PowerPoint presentations. These two classes were selected based on the similarity in student numbers and academic backgrounds, so any differences in outcomes can be considered a direct impact of the learning interventions provided.

*Description of Student Learning Motivation Data
Presentation of Learning Motivation Questionnaire Data*

Table 3. Learning Motivation Questionnaire Data for the Pre-Test and Post-Test of the Experimental and Control Classes

Respondents	PjBl (video)		Lecture (Ppt)	
	Pre-Test	Post-Test	Pre-Test	Post-Test
R1	123.00	133.00	106.00	111.00
R2	113.00	126.00	124.00	127.00
R3	115.00	128.00	103.00	108.00
R4	101.00	117.00	116.00	115.00
R5	121.00	129.00	108.00	111.00
R6	105.00	116.00	117.00	118.00
R7	124.00	132.00	123.00	125.00
R8	120.00	127.00	104.00	107.00
R9	114.00	123.00	120.00	122.00
R10	122.00	129.00	122.00	125.00
R11	109.00	121.00	102.00	105.00
R12	128.00	135.00	104.00	108.00
R13	113.00	122.00	125.00	129.00
R14	126.00	133.00	109.00	112.00
R15	101.00	112.00	123.00	122.00
R16	105.00	116.00	102.00	106.00
R17	122.00	131.00	121.00	125.00
R18	111.00	120.00	104.00	109.00
R19	99.00	112.00	120.00	120.00
R20	101.00	114.00	122.00	125.00
R21	125.00	133.00	103.00	105.00
R22	97.00	113.00	123.00	125.00
R23	105.00	118.00	124.00	128.00
R24	124.00	132.00	111.00	113.00
R25	98.00	114.00	107.00	111.00
R26	127.00	135.00	101.00	103.00
R27	113.00	125.00	105.00	107.00
R28	110.00	123.00	128.00	131.00
R29	119.00	129.00	118.00	116.00
R30	125.00	132.00	126.00	128.00
R31	105.00	123.00	105.00	108.00
R32	126.00	134.00	118.00	121.00
R33	108.00	120.00	122.00	126.00

Respondents	PjBl (video)	Lecture (Ppt)
R34	128.00	113.00
R35	105.00	120.00
Average	113.94	114.26

Based on the table, the average score for the experimental class' pre-test motivation questionnaire was 113.94, the average score for the experimental class' post-test motivation questionnaire was 124.63, the average score for the control class' pre-test motivation questionnaire was 114.26, and the average score for the control class' post-test motivation questionnaire was 116.86. Based on these pre-test and post-test averages, it can be concluded that there was an increase in the average student learning motivation questionnaire in the experimental class of 10.69, and an increase in the average student learning motivation questionnaire in the control class of 2.60. Although both the experimental and control classes experienced an increase in the average motivation questionnaire, the increase in the experimental class was higher than in the control class (Rizki et al., 2023; Saputri et al., 2021).

Descriptive Statistics for Student Motivation Scores in the Experimental and Control Classes

Table 4. Descriptive Statistics for Student Learning Motivation Scores in the Experimental Class

Descriptive Statistics					
Pre-Test	N	Minimum	Maximum	Mean	Std. Deviation
Post-Test	35	97.00	128.00	113.94	9.973
Valid N (listwise)	35	112.00	137.00	124.62	7.674

Based on the table, the descriptive statistics for student learning motivation were obtained. The pre-test for the experimental class (X Culinary 1) had a maximum score of 128.00, a minimum score of 97.00, a mean score of 113.94, and a standard deviation of 9.97. The post-test for the experimental class (X Culinary 1) had a maximum score of 137.00, a minimum score of 112.00, a mean score of 124.63, and a standard deviation of 7.67.

Table 4. Descriptive Statistics for Learning Motivation Scores in the Control Class

Descriptive Statistics					
Pre-Test	N	Minimum	Maximum	Mean	Std. Deviation
Post-Test	35	103.00	131.00	116.8571	8.51924
Valid N (listwise)	35				

Based on the table, the descriptive statistics for student learning motivation were obtained. The pre-test score for the control class (X Culinary 3) had a maximum score of 128.00, a minimum score of 101.00, a mean score of 114.26, and a standard deviation of 8.83. The post-test score for the control class (X Culinary 3) had a maximum score of 131.00, a minimum score of 103.00, a mean score of 116.86, and a standard deviation of 8.52.

Table 5. Descriptive Statistics of Learning Motivation Scores for the Experimental and Control Classes

Descriptive Statistics					
Nilai Post-Test	N	Minimum	Maximum	Mean	Std. Deviation
X Kuliner 1	35	112.00	137.00	124.62	7.67
X Kuliner 3	35	103.00	131.00	116.85	8.51
Valid N (listwise)	35				

Based on the table, the descriptive statistics for student learning motivation were obtained. The post-test score for the experimental class (X Culinary 1) was 137.00, with a minimum score of 112.00, a mean score of 124.63, and a standard deviation of 7.67. The post-test score for the control class (X Culinary 3) was 131.00, with a minimum score of 103.00, a mean score of 116.86, and a standard deviation of 8.52.

Improving Student Motivation and Learning Outcomes

The data analysis showed that the implementation of the Project-Based Learning (PjBL) model using video media had a significant and positive impact on student motivation and learning outcomes at SMKN 6 Padang, particularly in the Culinary Basics subject.

Improving Learning Motivation

The average learning motivation score in the experimental class increased from 113.94 to 124.63. This increase was significantly greater than the control class using the lecture method, which only increased from 114.26 to 116.86. This increase in motivation is consistent with constructivist theory Piaget & Vygotsky (Mebert et al., 2020; Mutanga, 2024; Rezai et al., 2025), which states that students become more motivated when actively engaged in learning through real-life projects. PjBL places students at the center of learning, encouraging them to design, work on, and complete culinary projects (Guo et al., 2020; Sani et al., 2024). This process creates a sense of responsibility and a clear sense of purpose, ultimately fostering intrinsic motivation (Aljumah, 2023; Cheng et al., 2023). The use of video media also supports this process by providing concrete and visual examples

that reinforce kinesthetic learning, in line with Fleming's VAK learning style theory (El-Saftawy et al., 2024; Hattie & O'Leary, 2025).

Improved Learning Outcomes

In addition to motivation, student learning outcomes also improved significantly. The average posttest score in the experimental class (84.54) was higher than in the control class (77.86). This indicates that the combination of PjBL and video media successfully improved students' conceptual understanding and cognitive abilities. According to Jamet & Michinov (2022); Lorusso et al. (2025); Minet et al. (2024), videos that combine visual and verbal elements accelerate information absorption. In the culinary context, video is a highly effective tool because students can see live demonstrations of cooking techniques before practicing them. This helps students reach higher levels of learning according to Bloom's Taxonomy, such as applying, analyzing, evaluating, and creating original products. Therefore, the video-based PjBL model has proven effective in improving learning outcomes by: Increasing active student engagement (Alpian et al., 2025; Fitriah et al., 2025; Masruri et al., 2024). Providing a deeper understanding of complex material through visual media; Encouraging higher-order thinking skills and teamwork (Haleem et al., 2022; Loyens et al., 2023; Ruiz-Rojas et al., 2024).

Research Limitations

While these findings are robust, several limitations warrant consideration: The short duration of the study, which means it cannot yet measure long-term effectiveness; External factors such as psychological conditions and family support were not fully controlled; and Subjective elements in the assessment of video projects, despite the use of a systematic rubric.

Conclusion

Based on the results of data analysis and discussion regarding the effectiveness of the implementation of the Project Based Learning (PjBL) model using video media on student motivation and learning outcomes in the Culinary Basics subject at SMKN 6 Padang, the following conclusions can be drawn: The learning motivation of students who participate in Project Based Learning (PjBL) using video media is significantly higher compared to students who participate in lecture method learning and PowerPoint media in the culinary basics subject at SMKN 6 Padang with a significance test result of 0.013 < 0.05.; The learning outcomes of students who participate in Project Based Learning (PjBL) using video media are significantly higher compared to

students who participate in lecture method learning and PowerPoint media in the culinary basics subject at SMKN 6 with a significance test result of $0.025 < 0.05$; The implementation of Project Based Learning (PjBL) using video media is significantly more effective compared to students who follow the lecture method and PowerPoint media in the culinary basics subject at SMKN 6 Padang with a significance test result of $0.001 < 0.05$.

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Author Contributions

Conceptualization; methodology; validation; formal analysis; investigation; resources; data curation: writing – original draft preparation; writing – review and editing; visualization: U., F. Y. All authors have read and approved the published version of the manuscript.

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Conflicts of Interest

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