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The Effect of the PBL Learning Model using Videos to Improve Student Motivation and Learning Outcomes in Geopolitical Material in Timor-Leste

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A B S T R A C T

Low student motivation and poor learning outcomes in geopolitics materials are often associated with the dominance of lecture-based methods and the limited use of instructional media. This study aims to determine the effect of the Problem-Based Learning (PBL) model assisted by video on students' motivation and geography learning outcomes. The research was conducted at Ensino Secundario Geral Catholic St. Madalena de Canossa, Dili, Timor-Leste, using a quasi-experimental method with a non-equivalent control group design. The subjects were Grade X students selected through purposive sampling based on comparable academic abilities. Data were collected through learning outcome tests and motivation questionnaires and analyzed using the t-test. The results showed that the average learning outcome score in the experimental class increased from 62.3 to 85.5, while the control class improved from 57.3 to 72.0. Statistical analysis indicated a significant effect of the video-assisted PBL model on students' motivation and learning outcomes. In conclusion, the implementation of video-assisted PBL is more effective than conventional teaching methods in enhancing students' motivation and geography learning outcomes in geopolitics materials.

1. Introduction

Timor-Leste is one of the youngest countries in Southeast Asia and has been independent for more than two decades. During this period, the education sector has been positioned as a fundamental pillar of national development. Currently, the education system in Timor-Leste is undergoing transformation aimed at improving the quality of learning. However, empirical observations indicate that many educators still face difficulties in implementing innovative learning models, particularly in subjects requiring complex analytical skills such as geography. As a result, learning processes tend to remain conventional and less stimulating for

students' active engagement (UNESCO, 2024). Teachers often rely on lecture-based methods and rarely integrate information technology into geography instruction. Consequently, learning becomes monotonous, less contextual, and limited in information, reducing opportunities for creative learning. Previous studies confirm that the lack of variation in learning models directly affects students' motivation and learning outcomes (Sejati et al., 2023). This condition is consistent with findings in the Journal of Educational Sciences, which show that conventional learning still dominates and contributes to low critical thinking and engagement in geography learning (Andini et al., 2025).

These limitations are reflected in students' low academic achievement, particularly in geopolitics materials. Learning outcomes are important indicators of educational success, covering cognitive, affective, and psychomotor aspects. Somayana (2020) emphasizes that optimal learning outcomes reflect both students' understanding and their active participation in achieving instructional objectives. However, empirical evidence shows that students' learning outcomes in geopolitics remain relatively low. This condition indicates challenges in understanding strategic concepts such as territorial dynamics, sovereignty boundaries, and global political interactions. Therefore, systematic efforts are required to evaluate and improve the learning process so that the causes of low achievement can be addressed effectively.

Low learning outcomes are closely related to students' lack of motivation. Muawanah and Muhid (2021) define motivation as an internal drive that initiates and directs learning behavior toward specific goals. Ryan and Deci (2020), through self-determination theory, highlight intrinsic motivation as a key factor influencing effective learning outcomes. However, studies such as Astawa (2022) reveal that students' motivation in learning geopolitics remains low. This finding is supported by Susdarwono (2022), who notes that not all students have positive perceptions toward complex subjects like geopolitics. Without sufficient motivation, students struggle to connect theoretical knowledge with real-world issues, which hinders the development of critical analytical skills, particularly in understanding regional stability and security.

The urgency of improving geopolitics learning becomes more evident when considering the strategic geographical position of Timor-Leste within the global geopolitical context. Geography is a key subject in the Ensino Secundario curriculum and should promote contextual learning. Geopolitics examines the relationship between geography and political power and requires the ability to connect physical and political dynamics (Mahmud & Hossain, 2025). However, this topic is often perceived as difficult due to its abstract nature. In fact, geopolitics is highly relevant for Timor-Leste as a young nation developing its identity and sovereignty. Susdarwono (2022) argues that geopolitics can become a strategic advantage in global interactions. Therefore, optimizing geopolitics learning is essential for preparing future generations who understand their country's position between Southeast Asia and Australia.

Despite its importance, this potential has not been fully realized in classroom practices, particularly at Ensino Secundario Geral Katolik St. Madalena de Canossa,

Dili. Preliminary observations show that learning is still dominated by lectures and note-taking without adequate technological support. Meanwhile, geopolitics requires visualization, case analysis, and interactive discussion to understand territorial dynamics and political power relations. The continued use of passive teaching methods makes it difficult to achieve comprehensive understanding and analytical competence. Therefore, the integration of engaging learning media is necessary to bridge abstract concepts with real-world political realities (Astawa, 2021). This aligns with the goals of geopolitical-oriented education, which aims to develop problem-solving abilities based on factual information (Hilmi, 2017).

To overcome these challenges, Problem-Based Learning (PBL) is considered an effective approach. PBL positions students as active learners by presenting real-world problems that must be analyzed and solved collaboratively (Meilasari & Yelianti, 2020). Previous studies published in the Journal of Educational Sciences also confirm that the implementation of the Problem-Based Learning model significantly improves students' learning outcomes when supported by interactive learning media (Ardiana et al., 2025). This approach supports the development of critical awareness needed in geopolitics, especially in analyzing causal relationships in conflicts and power dynamics (Birsyada, 2015). Through authentic problem-solving activities, learning shifts from teacher-centered instruction to a discovery-based process (Setyowati et al., 2024). Fitriani and Nawir (2024) further emphasize that PBL improves critical thinking skills and student engagement in understanding geopolitical dynamics.

The effectiveness of PBL can be enhanced through digital learning media, particularly video. Technology functions not only as a supporting tool but also as a catalyst for independent learning and increased motivation (Mahariyanti et al., 2024). In geopolitics learning, video helps visualize territorial boundaries and global conflicts that are difficult to understand through text alone. In addition, the integration of technology-based learning media within the PBL framework has been shown to increase students' motivation and cognitive achievement (Hafni et al., 2025). Rahmawati and Meilasari (2024) state that problem-solving ability is influenced by students' independence in exploring digital resources. Furthermore, the use of interactive media such as Canva and digital platforms in PBL environments has also been proven effective in enhancing student engagement and participation (Kurnia et al., 2025). Therefore, integrating video into learning can strengthen intrinsic motivation and improve learning outcomes. Unlike previous studies, this research positions video as a central component in the problem-orientation stage of PBL.

This study addresses a gap in previous research on PBL, particularly in geopolitics education in developing countries such as Timor-Leste. Although prior studies show that PBL and video-assisted learning improve motivation and performance, most focus on science or general social studies, with limited attention to geopolitics. Additionally, video is often treated only as a supporting medium rather than an integral part of the learning model. Furthermore, studies in the Journal of Educational Sciences highlight that audio-visual media integrated with PBL significantly influences students' interest and learning outcomes, yet its application

in geopolitics learning remains limited (Indrawati et al., 2026). Therefore, the novelty of this study lies in integrating video as a core element within the PBL framework to support the understanding of geopolitical concepts. This study also provides empirical evidence from the context of Timor-Leste, particularly related to border dynamics and national identity. This context contributes to the literature by demonstrating how contextual and visual learning enhances motivation and cognitive outcomes in geography education.

Based on the above discussion, this study aims to examine the effect of a video-assisted PBL model on students' motivation and learning outcomes in geopolitics. This research is important for strengthening geopolitical literacy among students in Timor-Leste as future leaders. Students are expected to develop awareness of their country's strategic position and understand territorial sovereignty more deeply. As stated by Susdarwono (2022), understanding geopolitics is essential for maintaining national existence and achieving national goals. The findings of this study are expected to contribute to the development of technology-based and contextual learning approaches in geopolitics education across Ensino Secundario institutions in Timor-Leste.

2. Methodology

This study employed a quantitative approach with a quasi-experimental design, specifically the Pretest-Posttest Non-Equivalent Control Group Design. The population consisted of all tenth-grade students in the social science program at Ensino Secundario Geral Katolik St. Madalena de Canossa, Dili, Timor-Leste, in the second semester of the 2024/2025 academic year. The participants were drawn from four parallel classes. Two classes were selected using purposive sampling based on the equivalence of academic ability, namely Class A and Class D. Subsequently, one class was assigned as the experimental group (XA), while the other served as the control group (XD). The experimental group received instruction using the video-assisted PBL model, while the control group was taught using conventional methods. To provide a clearer overview of the research procedure and group design, the structure of the experimental implementation is illustrated in Table 1.

Table 1. Research Design

Class	Pre-test	Treatment	Post-test
Experimental	O1	X	O2
Control	O3	-	O4

Notes
01,03 : Pre-tests conducted to the control and experimental groups
02,04 : Post-tests conducted to the control and experimental groups
X : Treatment using the video assisted PBL model
- : Conventional learning treatment

Instrument

The instruments used in this study consisted of a motivation questionnaire and a learning outcomes test. The questionnaire was designed to measure students' learning motivation based on four indicators: attention, interest, participation, and self-confidence. Meanwhile, the learning outcomes test was administered in the form of case-based essay questions to assess students' cognitive abilities, including understanding, analyzing, and evaluating. Before being administered, the research instruments were subjected to validity and reliability testing. The validity of the questionnaire and test items was examined using expert judgment and item analysis to ensure alignment with the research indicators. Meanwhile, the reliability of the motivation questionnaire was measured using Cronbach's Alpha coefficient, indicating that the instrument was sufficiently consistent for data collection.

Data Collection

Data were collected using two techniques. First, a non-test technique in the form of a questionnaire was used to measure students' learning motivation. Second, a test technique was employed through pre-test and post-test instruments to evaluate students' learning outcomes. The pre-test was administered before the treatment to determine students' initial abilities, while the post-test was conducted after the treatment to measure the improvement in learning outcomes.

Data Analysis

Data analysis was carried out using both descriptive and inferential statistical methods. Descriptive analysis was used to present the distribution, mean scores, and gain scores of students' motivation and learning outcomes. Inferential analysis was conducted using the Independent Samples t-test to determine whether there were significant differences between the experimental and control groups. Prior to hypothesis testing, prerequisite analyses were performed, including tests of normality and homogeneity. The normality test was conducted to ensure that the data were normally distributed, while the homogeneity test was applied to confirm that the variances between the experimental and control groups were equal. These prerequisite tests justified the use of the Independent Samples t-test for hypothesis testing.

3. Results and Discussion

The Effect of the Video-Assisted PBL Model on Geography Learning Motivation

The data on students' learning motivation in both the control and experimental groups were obtained through a structured questionnaire covering four main indicators, namely attention, interest, participation, and self-confidence. To provide a clearer overview of the distribution of students' motivation levels, the results of the descriptive analysis are presented in Table 2. Based on these data, there are observable differences in the distribution of learning motivation between the two

groups, particularly in the proportion of students categorized at higher levels of motivation.

Table 2. Distribution of Learning Motivation in the Control and Experimental Classes

Score Interval	Category	Control Class		Experimental Class	
		f	%	f	%
1	2	3	4	5	6
66-80	Very High	4	9	13	30
50-65	High	34	79	28	65
35-49	Moderate	5	12	2	5
17-34	Low	0	0	0	0
≤16	Very Low	0	0	0	0
Total		43	100%	43	100%

Referring to Table 2, the experimental group demonstrated a higher proportion of students in the "Very High" motivation category (30%) compared to the control group (9%), while the majority of the control group remained in the "High" category (79%). No students in either group were categorized as "Low" or "Very Low", indicating that both approaches maintained motivation at an adequate level, but the video-assisted PBL model was more effective in promoting optimal motivation. To further examine whether the observed differences were statistically significant, hypothesis testing was conducted using the Independent Samples t-test, the results of which are presented in Table 3. The statistical analysis showed a significance value of $p < 0.001$ ($t(84) = 4.061$), indicating a statistically significant difference in learning motivation between the two groups.

Table 3. Independent t-test Results for Learning Motivation

1. Levene's test for equality of variances			t-test for Equality of Means			
	f	Sig.	T	df	Sig. (2tailed)	Mean difference
Equal variances assumed	.008	0.928	4.061	84	.000	5.209
Equal variances not assumed			4.061	83.973	.000	5.209

The increase in students' motivation can be interpreted based on the measured indicators. The integration of video in the problem-orientation stage enhances students' attention and interest, as visual representations of geopolitical issues make learning more engaging and relevant. In addition, the PBL process encourages active discussion and collaboration, which contributes to increased participation, while opportunities to present and defend ideas support the development of self-confidence. This finding is consistent with previous research by Ananda et al. (2023), which highlights that integrating multimedia into problem-based learning environments enhances engagement and self-efficacy. From a theoretical perspective, this result can be explained by self-determination theory (Ryan & Deci, 2020), where autonomy, competence, and relatedness are facilitated through PBL activities, as supported by Howard et al. (2021) and Bureau et al. (2022).

Moreover, authentic and contextual problems contribute to situational interest, which develops into intrinsic motivation (Rotgans et al., 2019), particularly in the context of Timor-Leste where students are directly exposed to geopolitical realities. This is further strengthened by contextual factors, as proximity to real geopolitical issues reinforces the relevance of learning (Hendrajit, 2017; Ryan & Deci, 2000). The integration of video media also supports both cognitive and affective engagement, as visual media effectively convey complex concepts (Arsyad, 2019) and enhance meaningful learning experiences (Noverati et al., 2020; Yang et al., 2023). Therefore, the increase in motivation is primarily reflected in improvements in attention, participation, and self-confidence during learning activities.

Finally, these findings have implications for geography education in fostering spatial awareness and national resilience, as understanding geopolitics plays a strategic role in developing national perspectives (Susdarwono, 2022). This finding is also supported by previous studies in the Journal of Educational Sciences, which demonstrate that PBL integrated with audio-visual media significantly increases students' learning interest and motivation (Indrawati et al., 2026).

The Effect of the Video-Assisted PBL Model on Geography Learning Outcomes

Students' learning outcomes were measured using pretest and posttest essay-based assessments designed to evaluate cognitive competencies in geography, including understanding, analysis, and evaluation. To provide a comprehensive overview of students' performance, the distribution of learning outcomes in both groups is presented in Table 4.

Table 4. Distribution of Learning Outcomes in the Control and Experimental Classes

Score Interval	**Category**	**Control Class**				**Experimental Class**			
		Pre test		**Post test**		**Pre test**		**Post test**	
		f	**%**	**f**	**%**	**f**	**%**	**f**	**%**
1	2	3	4	5	6	3	4	5	6
85-100	Very High	0	0	2	5	0	0	8	19
70-84	High	6	14	23	53	7	16	29	53
55-69	Moderate	28	65	18	42	32	74	6	42
50-54	Low	6	14	0	0	3	7	0	0
≤49	Very Low	3	7	0	0	1	2	0	0
Total		43	100%	43	100%	43	100%	43	100%
Mean			57,3		72,0		62,3		85,5
Gain Score					14,7				23,2

Based on Table 4, both groups experienced improvements; however, the experimental group showed a more substantial increase. The mean score in the control group increased from 57.3 to 72.0 (gain = 14.7), while the experimental group increased from 62.3 to 85.5 (gain = 23.2), indicating a stronger impact of the video-assisted PBL model on students' cognitive development. To further illustrate these differences, the comparison of pretest, posttest, and gain scores is visually presented in Figure 1. The graphical representation clearly shows that students in

the experimental group achieved consistently higher scores across all measurement points, reinforcing the effectiveness of the video-assisted PBL model in improving learning outcomes.

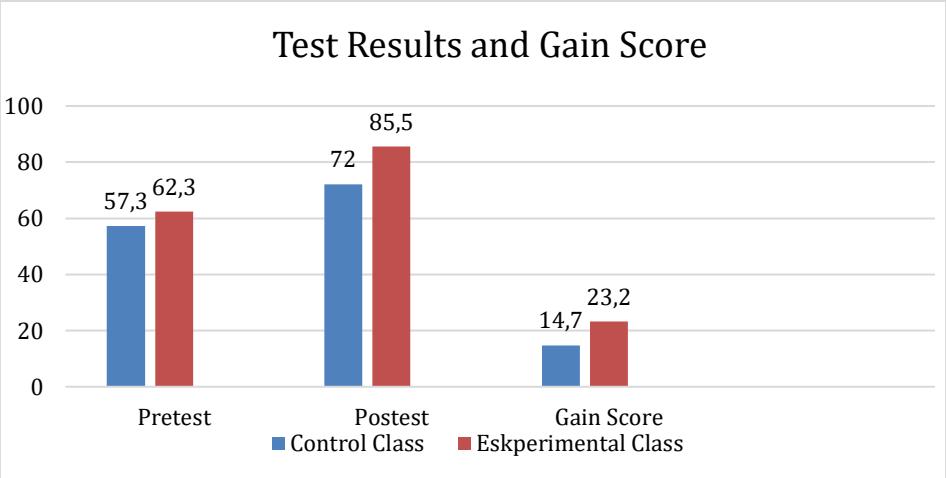

Figure 1. Graph of Mean Pretest, Posttest, and Gain Scores of Geography Learning Outcomes

Further statistical analysis using the Independent Samples t-test, as presented in Table 5, revealed a significance value of $p < 0.001$ ($t(84) = 6.882$), indicating that the difference in learning outcomes between the experimental and control groups is statistically significant. This finding confirms that the application of the video-assisted PBL model has a meaningful impact on students' academic performance in geography, particularly in geopolitics topics.

Table 5. Independent Samples T-Test Results for Geography Learning Outcomes

	Levene's test for equality of variances		**t-test for Equality of Means**			
	f	**Sig.**	**T**	**df**	**Sig. (2tailed)**	**Mean difference**
Equal variances assumed	9.738	.002	6.882	84	.000	13.5
Equal variances not assumed			6.882	72.937	.000	13.5

The improvement in learning outcomes can be explained by the characteristics of the PBL model, which promotes active learning, problem-solving, and critical thinking. Students in the experimental group were required to analyze real-world geopolitical cases presented through video, which enhanced their ability to understand and evaluate complex concepts. As supported by Nicholus et al. (2024) and Wahelo et al. (2025), PBL encourages deeper cognitive processes, while Mahmud & Hossain (2025) emphasize the importance of analytical skills in understanding geopolitical dynamics. The use of video further strengthens this process by providing contextual visualization, which improves comprehension of abstract material (Shen et al., 2022; Fadjarajani et al., 2024).

Moreover, learning in this study reflects situated learning, where knowledge is constructed through meaningful contexts. Video provides real-world scenarios, and PBL facilitates systematic analysis, enabling students to connect theory with practice. This combination supports both conceptual understanding and higher-order thinking skills. Finally, these findings indicate that the integration of video-assisted PBL is an effective strategy for improving geography learning outcomes. However, as emphasized by Wahelo et al. (2025), the success of this approach depends on problem design and teacher facilitation. Similar results were reported in the Journal of Educational Sciences, where PBL assisted by digital platforms significantly improves learning outcomes compared to conventional methods (Ardiana et al., 2025).

Limitation

Despite the significant findings, this study has several limitations. First, the use of a quasi-experimental design without full randomization may limit the generalizability of the results. Second, the study was conducted in a single school with a relatively small sample size, which may not fully represent broader educational contexts. Third, the measurement of motivation relied on self-reported data, which may be subject to response bias. Therefore, future research is recommended to involve larger samples, multiple institutions, and mixed-method approaches to provide a more comprehensive understanding of the effectiveness of video-assisted PBL.

4. Conclusion

This study concludes that the implementation of the video-assisted Problem-Based Learning (PBL) model has a positive and significant effect on students' motivation and geography learning outcomes in geopolitics materials. The findings indicate that integrating video into the PBL framework creates a more engaging and meaningful learning environment, where students actively participate in problem-solving, discussion, and knowledge construction. This approach successfully enhances students' learning autonomy, confidence, and collaborative engagement, which in turn contributes to improved academic performance. The success of this study demonstrates that the combination of PBL and video media is an effective pedagogical strategy for teaching complex and contextual topics such as geopolitics. Video functions as a supportive tool that helps students visualize real-world issues, while the PBL process plays a central role in fostering critical thinking and deeper conceptual understanding. Therefore, this model is highly recommended for geography learning, particularly in contexts that require analytical and spatial thinking skills.

However, this study is limited to a specific context and sample. Future research is suggested to involve a wider range of participants, apply different research designs, and integrate qualitative approaches to gain deeper insights into students' learning experiences and the long-term effectiveness of video-assisted PBL.

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