Physical Education Students' Knowledge and Motivation in Lesson Study and Conventional Classes Using Audio-Visual-Supported Learning

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(Received: 20-03-2026 Revision: 25-06-2026 Accepted: 09-08-2026 Published: 09-08-2026)

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DOI: 10.31605/ijes.v8i1.6745

Abstract

The success of learning in Physical Education is shaped by teaching methods that enhance both cognitive abilities and motivation among students. This research aimed to investigate how the Lesson Study approach, applied in a learning environment enriched with audio-visual resources, impacts students' understanding and motivation in Physical Education. A quantitative post-test-only comparison group design was utilized, involving 76 Physical Education students from Universitas PGRI Adi Buana Surabaya. Participants were assigned to either a conventional learning group (n = 38) or a Lesson Study group (n = 38), both receiving instruction enriched by audio-visual materials. Data were gathered through a structured knowledge test and the Expectancy-Value Questionnaire. The analysis employed independent-samples t-tests, with a significance threshold set at $p < 0.05$. The findings revealed that students in the Lesson Study group scored significantly higher on knowledge assessments compared to those in the conventional group (87.5 vs. 73.5; $p = 0.01$). Conversely, motivation scores were marginally greater for the Lesson Study group than for the conventional group (4.8 vs. 4.6), although this difference lacked statistical significance ($p = 0.62$). These results suggest that the implementation of Lesson Study in an audio-visual-supported learning context is linked to improved knowledge performance for Physical Education students, while its impact on learning motivation did not show statistical support.

Keyword: *Audio Visual Media; Lesson Study; Physical Education; Learning Motivation; Student Knowledge.*

1. INTRODUCTION

The effectiveness of the educational process is largely influenced by how well teachers implement their instructional techniques. In today's educational landscape, conventional teaching methods are often seen as inadequate for effectively capturing the attention and enthusiasm of learners, leading to unsatisfactory educational results. As a result, there is a demand for advancements in teaching techniques and resources to foster a more engaging and valuable learning atmosphere. One such advancement is the incorporation of audio-visual resources, which offers a more lively educational experience by combining sound and visual aspects. Research has shown that this type of media can enhance understanding of concepts, help with retention of information, and boost student motivation (Marheni et al., 2019). By incorporating audio-visual materials into lessons, educators can strategically improve learning results while encouraging greater student involvement.

In Physical Education, the use of innovative learning tools is crucial, as it addresses not only theoretical concepts but also the development of motor skills, participation in physical activities,

and stimulation of student engagement (Martín-Rodríguez & Madrigal-Cerezo, 2025). Successful teaching techniques in Physical Education should effectively and attractively present movement skills so that learners can grasp and practice the taught content more easily (Lubans et al., 2017). Audio-visual resources can significantly enhance the learning experience by allowing students to observe movement demonstrations, game strategies, and exercise techniques more effectively than through traditional verbal instructions (Arfi et al., 2024). Additionally, integrating audio-visual materials in Physical Education classes can elevate students' motivation, engagement, and confidence during activities, fostering a more interactive and student-centered educational environment (Alhadi et al., 2025).

One promising strategy for enhancing the quality of learning is through Lesson Study initiatives. Buchard & Martin, (2017) describe lesson study as a professional development approach aiming to enhance overall learning quality through collective and continuous investigation. This practice has been widely embraced in various educational institutions as a way to elevate the teaching and learning experience. According to Jones, (2024), Lesson Study is a collaborative framework where educators identify learning challenges, design educational activities, observe lessons, assess, and adjust teaching methods based on collective reflections. This cycle allows teachers to identify real solutions to the learning challenges faced in classrooms.

The Lesson Study approach aims not only to elevate learning quality but also to enhance the professional growth of educators. Collaborative efforts among teachers promote innovation in instructional techniques and evaluation of learning outcomes. Kihara et al., (2021) noted that using audio-visual media within Lesson Study can foster a more engaging and participatory educational environment. The synergy of these two methods can create a learner-centric educational setting, stimulate active participation, and enhance learning outcomes and motivation. Therefore, Lesson Study plays an essential role in establishing a reflective and collaborative educational framework focused on elevating the overall quality of education.

The capacity of teachers to deliver content in an interesting way and inspire students to engage actively in the educational experience is a significant measure of an educator's professionalism (Hardiansyah et al., 2024). In this framework, Lesson Study serves as a beneficial method of professional development aimed at improving educator skills. This practice takes place in a real classroom setting, allowing teachers and lecturers to work together across different subjects and cultivate thoughtful practices about their teaching methods. As noted by Saleh & Syukur, (2021), Lesson Study not only enhances teaching techniques but also encourages a culture of cooperative learning among educators. Through collaborative lesson planning, monitored teaching execution, and evaluation of outcomes, educators have the chance to keep refining their teaching abilities, thereby improving educational quality.

Originally, Lesson Study was established in Japan as a strategy for enhancing learning quality through reflection and teamwork (I Gede Nurjaya & I Gusti Ayu Agung Manik Wulandari, 2023). This framework includes several steps: planning (plan), execution (do), and evaluation (see). During the planning phase, educators work together to create a lesson plan based on recognized challenges in the classroom. In the execution phase, the plan is put into action in the classroom, supported by observations from peers. Finally, in the evaluation phase, the results from the execution are assessed and adjusted for further enhancement. Scholars like Jusnita et al., (2020) and Gunawan et al., (2015) have even expanded the Lesson Study stages into five to eight cycles to achieve better outcomes in teaching effectiveness.

Despite the established advantages of Lesson Study and audio-visual tools, numerous educational institutions still depend on traditional methods. Boring conventional techniques often do not inspire students to learn (Nuraini & Odi, 2024). Low engagement and enthusiasm for

learning present major challenges that educators must tackle in today's digital environment. Hence, merging Lesson Study with audio-visual tools offers a strategic approach to boost student learning and motivation. This combination aims to meet the challenges of contemporary education by incorporating technology as an appealing and effective educational resource.

Moreover, alongside applying suitable learning models, selecting the right learning media is vital for achieving the best learning results. Audio-visual resources, especially in the context of fitness education or physical training, have proven to engage two primary human senses: sight and hearing. State that audio-visual media offers a more immersive learning experience as it features moving images paired with sound, assisting students in grasping ideas through tangible visual examples. Maulida & Hadi, (2022) added that this media is particularly effective for practice-oriented learning, such as in physical education, since it can directly illustrate movement examples, techniques, and exercise methods.

Based on the previously mentioned findings, there exists a research gap concerning whether the use of Lesson Study offers additional advantages compared to traditional teaching methods when both methods utilize the same audio-visual materials. Past research has mostly looked at Lesson Study or audio-visual tools independently as teaching strategies, resulting in scant evidence regarding the extra value that the Lesson Study approach might add under similar media-supported educational settings. Thus, the originality of this current research is rooted in its comparison of audio-visual-supported teaching through Lesson Study against conventional audio-visual-supported teaching among Physical Education students at PGRI Adi Buana University in Surabaya. Within this framework, both groups have access to audio-visual resources, while the key difference lies in the teaching approach: the intervention group engages in collaborative planning, observation, and reflection through Lesson Study, while the comparison group continues with traditional teaching methods. This design allows for a focused examination of whether the collaborative and reflective nature inherent in the Lesson Study process leads to more significant improvements in students' learning achievements and motivation, surpassing the contributions made by the audio-visual materials alone. Consequently, this research aims to evaluate how the integration of audio-visual resources within the Lesson Study framework contrasts with conventional audio-visual-supported instruction in enhancing students' comprehension and motivation towards physical fitness development. The anticipated results are expected to offer empirical evidence about the additional benefits of Lesson Study in similarly media-supported educational contexts and support the evolution of more collaborative, reflective, and contextually appropriate teaching practices in Physical Education.

2. METHODS

2.1. Research Design and Participants

This study employed a quantitative post-test-only comparison group design to compare students' knowledge and learning motivation between Lesson Study-based and conventional instruction under the same audio-visual-supported Physical Education condition. Two intact classes were selected through purposive sampling based on class availability at Universitas PGRI Adi Buana Surabaya. The participants were 76 undergraduate Physical Education students aged 21–23 years, comprising 38 students in the conventional group (20 males, 18 females) and 38 students in the Lesson Study group (19 males, 19 females). Both groups received the same course content, contact time, and audio-visual materials, including tutorial videos. The conventional group received lecturer-led instruction, whereas the Lesson Study group participated in the Plan, Do, and See process. The intervention consisted of four weeks and eight sessions, organized into two Lesson Study cycles, with approximately 100 minutes per session. One model lecturer taught both

groups, while two observers participated in the Lesson Study planning, observation, and reflection. The learning content focused on physical fitness development, including concepts, principles, and practical exercises such as shoulder muscle training. Because only one intact class represented each condition, class effects could not be separated from instructional-condition effects; therefore, findings were interpreted as between-group associations rather than definitive causal effects. Ethical approval was obtained from the Research Ethics Committee of Universitas PGRI Adi Buana Surabaya (012/KEPK/UPAB/2024), and written informed consent was obtained from all participants.

2.2. Lesson Study Implementation

The Lesson Study intervention was carried out in three distinct phases: Plan, Do, and See. This process is outlined in Table 1 and was applied to the Lesson Study class, whereas the traditional class underwent standard teaching utilizing identical audio-visual learning resources.

Table 1. Stages of Lesson Study Implementation

Stage	Description of Activties
Plan	The model lecturer prepared lesson plans, lesson designs, learning media, and observation instruments collaboratively with the observer team.
Do	Learning activities were conducted using audio-visual media in the form of tutorial videos. Students worked in groups and searched for additional materials using digital media.
See	The model lecturer and observers conducted reflection sessions to evaluate the learning process and determine improvements for future learning activities.

2.3. Instruments and Data Collection

Learning motivation was measured using an Indonesian-adapted version of the Expectancy-Value Questionnaire from (Østerlie et al., 2019). The instrument was translated and back-translated by bilingual professionals and reviewed by three experts in Physical Education and educational psychology. The questionnaire consisted of five expectancy items and six task-value items, rated on a five-point Likert scale (1 = strongly disagree to 5 = strongly agree). The two subscales were analyzed separately because they represent distinct constructs. Internal consistency was satisfactory (Cronbach's $\alpha = 0.87$).

Knowledge was assessed using a researcher-developed 25-item achievement test aligned with the course objectives. Content validity was reviewed by three Physical Education professors. Item difficulty and discrimination were examined, with indices of 0.30–0.70 and ≥0.30, respectively, used as example acceptance criteria. Correct and incorrect responses were scored 1 and 0, respectively, and converted to a 0–100 scale using: Knowledge Score = (correct answers/25) × 100. The test demonstrated good internal consistency (KR-20 = 0.81).

2.4. Data Analysis

Descriptive statistics (n, mean, and SD) and independent-samples t-tests were used to compare the two groups. Normality was assessed using the Shapiro-Wilk test and homogeneity of variance using Levene's test. The analysis included t, df, exact p values, 95% confidence intervals, and Cohen's d as an effect-size estimate. Statistical significance was set at $p < .05$, and analyses were performed using IBM SPSS Statistics 26.0. Because the study used a post-test-only design, non-randomized intact classes, and one class per condition, the results were interpreted as associations between instructional conditions rather than definitive causal effects.

3. RESULTS AND DISCUSSION

3.1. Result

This study aimed to explore the impact of using Lesson Study along with audio-visual resources on students' comprehension and enthusiasm for learning in Physical Education. The findings were obtained by contrasting the group involved in conventional learning with the group taking part in Lesson Study.

Table 2. Normality and Independent t-Test Results

Outcome	Group	n	Shapiro–Wilk (W)	p	t	df	p	95% CI	Cohen's d
Learning motivation	Conventional	38	0.965	0.274	0.5	74	0.62	−0.22 to 0.42	0.11
	Lesson Study	38	0.958	0.167					
Knowledge achievement	Conventional	38	0.972	0.438	2.67	74	0.01	3.54 to 24.46	0.61
	Lesson Study	38	0.964	0.258					

Table 2 illustrates that the learning motivation and knowledge achievement scores fulfilled the normality criteria in both groups (all Shapiro–Wilk p values > .05). The independent-samples t-test indicated that there was no statistically significant variance in learning motivation between the conventional and Lesson Study groups, t (74) = 0.50, p = .620, 95% CI (−0.22, 0.42), d = 0.11. Despite the Lesson Study group achieving a marginally higher motivation mean score (M = 4.80, SD = 0.39) compared to the conventional group (M = 4.60, SD = 0.42), this discrepancy was minor and lacked statistical significance.

Conversely, the Lesson Study group attained a markedly superior posttest knowledge score (M = 87.50, SD = 14.50) compared to the conventional group (M = 73.50, SD = 20.00), t (74) = 2.67, p = .010, 95% CI (3.54, 24.46), d = 0.61. The results thus suggest a statistically significant difference in posttest knowledge achievement between the two teaching methods. Nevertheless, as this study implemented a posttest-only design with one intact class for each condition and excluded random assignment, this difference must be regarded as a correlation between the teaching condition and the knowledge achievement rather than conclusive proof of Lesson Study's effect on the superior score.

Table 3. Comparison of Students' Motivation and Knowledge

Outcome	Conventional Group (n = 38)	Lesson Study Group (n = 38)	Mean Difference	t	df	p	95% CI	Cohen's d
Learning motivation	4.60 ± 0.42	4.80 ± 0.39	0.2	0.5	74	0.62	−0.22 to 0.42	0.11
Knowledge achievement	73.50 ± 20.00	87.50 ± 14.50	14	2.67	74	0.01	3.54 to 24.46	0.61

As demonstrated in Table 3, the Lesson Study group achieved a notably higher posttest knowledge score (M = 87.5) than the conventional group (M = 73.5), which was statistically significant with a between-group difference (p = .01). This outcome signifies a relationship between the teaching condition and students' posttest knowledge performance. However, due to the posttest-only design utilizing intact classes without random assignment, this difference should not

be viewed as irrefutable evidence that Lesson Study induced the enhanced knowledge score. Regarding learning motivation, the Lesson Study group exhibited a marginally higher mean score than the conventional group (4.8 vs. 4.6), but this difference was not found to be statistically significant (p = .62). Consequently, the outcomes do not offer statistical proof of a difference in learning motivation between the two instructional methods.

The increase in educational outcomes for the Lesson Study group was also supported by the use of audio-visual materials, which helped clarify ideas and movement techniques for learners. Through instructional videos, students could see movement examples directly, making the learning process more engaging and comprehensible. These findings correspond with the study by (Emiliasari, 2018), which demonstrated that Lesson Study not only develops teacher skills but also contributes to overall education quality.

Regarding learning motivation, the Lesson Study group recorded an average score of 4.8, while the conventional group scored 4.6. Nonetheless, the difference observed between the two groups was not statistically significant (p = .62), suggesting that the variation in motivation levels cannot be linked to the instructional approach used. Consequently, the findings do not offer adequate evidence that Lesson Study-based instruction is associated with greater learning motivation compared to traditional instruction in the context of audio-visual-supported learning.

The outcomes of this study support the assertion made by Vitantri, (2014), who noted that Lesson Study enhances educational quality through collaborative and reflective practices. Furthermore, Isfahani, (2022) pointed out that Lesson Study transforms classrooms into active research environments, enabling teachers to assess and improve their teaching methods systematically. Likewise, research by Petrus Rame et al., (2021) indicated that implementing Lesson Study can boost educators' effectiveness and enhance students' learning experiences.

The results should primarily be interpreted concerning the two predetermined student outcomes: knowledge achievement and learning motivation. Although the Lesson Study method entails collaborative planning, execution, observation, and reflection among instructors, this study did not directly assess changes in professional relationships or the establishment of a professional learning community. As such, these elements cannot be regarded as outcomes of this research. Instead, the findings highlight that the Lesson Study class achieved a significantly higher posttest knowledge score than the conventional class while showing no statistically significant difference in learning motivation. These outcomes imply that the impact of Lesson Study in the given context is more suitably discussed in terms of students' knowledge achievement rather than any unmeasured alterations in lecturer collaboration or professional relations.

During the preparation stage, the model teacher collaborated with observers to design lesson plans, select audio-visual materials, and create assignments for learners. This phase aimed to ensure that the educational activities would be conducted in an organized way and meet the established learning objectives.

In the implementation stage, learning sessions occurred in the Physical Education lab, using audio-visual aids such as instructional videos for workouts. The students showed a lot of enthusiasm as the teaching strategies differed from conventional methods. They also received group projects to explore shoulder muscle training exercises through online resources and present their results. However, a significant issue that arose during the educational process was the limited availability of modules and textbooks, which caused students to rely more on their smartphones for finding study material.

In the assessment stage, both the model teacher and observers evaluated the effectiveness of the learning activities. The assessment findings highlighted that teachers needed to provide clearer explanations of concepts, supply additional educational resources like modules or

textbooks, and offer better-organized summaries at the end of the lesson. This assessment phase was vital for Lesson Study as it set the foundation for improving future teaching approaches.

The results of this study demonstrate that Lesson Study supported by audio-visual learning resources was related to differences in students' knowledge achievement. Students in the Lesson Study group achieved a higher mean knowledge score (87.5) compared with those in the conventional learning group (73.5), with the difference reaching statistical significance. This finding suggests that the collaborative and reflective processes embedded in Lesson Study, including the Plan, Do, and See cycles, may facilitate more effective instructional practices and improve students' understanding of Physical Education concepts.

The improvement in knowledge outcomes may be explained by the characteristics of Lesson Study, which encourages teachers to collaboratively design learning activities, observe classroom implementation, and reflect on instructional effectiveness. In addition, the use of audio-visual resources may have supported the presentation of learning materials by providing clearer demonstrations and contextual representations of concepts. These findings are consistent with Emiliasari, (2018), who reported that Lesson Study contributes to improving teaching practices through collaborative reflection and student-centered learning approaches.

Regarding learning motivation, the Lesson Study group demonstrated a descriptively higher score (4.8) than the conventional group (4.6). However, the statistical analysis showed that this difference was not significant ($p = 0.62$). Therefore, the findings do not provide sufficient evidence to conclude that Lesson Study significantly improved students' motivation. The slightly higher descriptive score may indicate a potential positive tendency; however, this observation requires further investigation using longitudinal or experimental designs with baseline measurements.

The findings highlight that Lesson Study may be more immediately associated with cognitive learning outcomes than motivational changes. Future studies should consider longer intervention periods, pre-test and post-test measurements, and larger samples to further examine how Lesson Study influences different dimensions of student learning in Physical Education.

These results agree with Cerbin & Kopp, (2006), who found that lesson study fosters a professional learning community among teachers. In this study, the application of audio-visual resources enriched all three phases of the lesson study: plan, do, and see. In the planning phase, model teachers crafted lessons using visual aids to explain complex ideas. During the doing phase, the use of audio-visual resources sparked students' interest and improved their understanding. Finally, in the seeing or reflective phase, both model teachers and observers assessed how the media's integration affected the learning results, facilitating ongoing instructional enhancements.

Moreover, research by Vitantri, (2014) and Isfahani, (2022) highlighted that lesson study turns classrooms into reflective research settings, enabling teachers to systematically watch, analyze, and enhance their teaching methods. The current findings affirm that adding audio-visual content to this approach strengthens that process, providing clear and measurable tools for observation and reflection. Likewise, Stated that lesson study enables teachers to perceive teaching as an inquiry-based study within the classroom, improving educational quality and student attitudes.

In summary, this research indicated that the Lesson Study class achieved a notably higher score on the posttest of knowledge compared to the traditional class, both utilizing the same audio-visual learning resources. Nevertheless, the variance in learning motivation did not reach statistical significance. Given the study's design focusing solely on posttest results, the reliance on pre-existing classes, and the lack of random assignment, the conclusions drawn should be viewed as a correlation between the teaching method and students' knowledge attainment rather than conclusive proof of a direct effect of Lesson Study (Haziah et al., 2018). Additional research

employing randomized or pretest-posttest methodologies is necessary to better understand the role of the Lesson Study process in enhancing students' knowledge and learning motivation.

The outcomes of this research carry several significant implications:

1. For educators, integrating audio-visual media in lesson study can serve as a powerful model for professional growth aimed at improving teaching standards. Teachers are encouraged to create lesson plans that utilize digital and visual resources to make difficult ideas more straightforward and engaging.
2. For learners, the use of lesson study along with audio-visual tools offers a more engaging and significant educational experience, boosting enthusiasm, teamwork, and comprehension.
3. For educational institutions, schools and universities ought to promote lesson study efforts by offering facilities, training, and materials for audio-visual education. Support from the institution guarantees the long-term success and impact of lesson study initiatives.
4. For upcoming research, this investigation creates chances to examine the application of additional digital advancements like virtual simulations or AI-driven learning resources within the lesson study framework to further improve educational results and motivation.

In conclusion, it can be said that lesson study paired with audio-visual tools is an impactful educational method that can enhance not just students' cognitive success but also their emotional and motivational aspects, while promoting professional cooperation among teachers.

3.2. Discussion

This research has a number of limitations that must be acknowledged when interpreting the results. Firstly, the post-test-only design that did not involve randomization, which utilized existing classes, restricts the ability to determine causal links between the Lesson Study method and student outcomes. As no pretest was conducted, it was not possible to eliminate potential pre-existing differences between the two classes entirely. Secondly, the fact that only one intact class was used for each instructional approach creates a clustering challenge, meaning that characteristics specific to each class were fully intertwined with the respective instructional method. Although independent-samples t-tests at the student level were employed, this analysis treated each observation as independent and was unable to statistically distinguish between class effects and the Lesson Study intervention. Therefore, the results should be regarded as initial differences identified between these particular classes instead of indicative of a broad intervention impact of Lesson Study. Future investigations should include multiple classes per condition and, where possible, involve randomized or pretest-posttest designs to minimize class-level confounding and to provide more substantial evidence about the effects of Lesson Study on students' knowledge and learning motivation.

Secondly, the participants were sourced from existing classes at one university, which may restrict the applicability of the results to other settings within Physical Education. Future studies ought to involve broader and more varied participant groups from various institutions and educational levels to enhance the external applicability of the findings.

Thirdly, the intervention took place over a restricted instructional timeframe, which may not have been adequate to assess the enduring effects of the Lesson Study on students' knowledge advancement and learning enthusiasm. Future inquiries should consider extending the intervention duration and incorporating multiple Lesson Study cycles to investigate persistent changes in educational outcomes.

Fourthly, students' learning motivation was evaluated through a self-report questionnaire, which could be subject to individual perceptions and reporting biases. It is advisable for upcoming research to merge self-reported data with other metrics, such as behavioral observations, participation records, or qualitative insights gained from interviews and classroom assessments.

Finally, although the Lesson Study cohort exhibited a marginally higher motivation score than the traditional group, this difference did not reach statistical significance. As a result, the findings do not sufficiently substantiate that the Lesson Study directly enhances students' learning motivation. Future studies should delve deeper into the connection between Lesson Study and motivational results, taking into account longer intervention periods, more refined measurement tools, and additional contextual elements that might affect student motivation.

In spite of these limitations, this study presents preliminary evidence suggesting that the Lesson Study implemented within an audio-visual-supported educational environment may aid in enhancing knowledge outcomes for students in Physical Education. Additional research utilizing more robust methodological frameworks is necessary to verify and expand upon these findings.

4. CONCLUSION

The findings indicate that Lesson Study implemented in an audio-visual-supported Physical Education learning environment was associated with higher knowledge achievement among students compared with conventional instruction. The Lesson Study group obtained higher knowledge scores (87.5) than the conventional group (73.5), indicating that the collaborative planning, implementation, and reflection processes within Lesson Study may support students' conceptual understanding. However, although the Lesson Study group showed a slightly higher motivation score (4.8) compared with the conventional group (4.6), the difference was not statistically significant. Therefore, the effect of Lesson Study on students' learning motivation should be interpreted cautiously. Overall, Lesson Study provides a promising instructional approach for improving knowledge outcomes, while further research using stronger experimental designs is needed to examine its broader effects on student motivation.

5. ACKNOWLEDGMENTS

The authors would like to express their sincere gratitude to Universitas PGRI Adi Buana Surabaya for the support and materials supplied during this research endeavor. They also extend their deep appreciation to the teachers, observers, and learners from the Physical Education Department who contributed actively and provided their assistance during the Lesson Study sessions.

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