



The Influence of Learning Media on Improving Underpassing in Terms of Student Learning Motivation

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Keywords

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Abstract

This study aimed to determine the effect of instructional media on forearm passing ability in volleyball and to examine whether learning motivation moderates this effect among Grade XII students at SMA Pasundan Banjaran. A quasi-experimental design with a Nonequivalent Control Group Design and pretest-posttest scheme was employed. The sample consisted of 35 students divided into an experimental group (n=17, Class XII-A) receiving instructional media treatment and a control group (n=18, Class XII-B) taught using conventional methods. Forearm passing ability was measured through pretest and posttest assessments, while learning motivation was assessed using a validated questionnaire. Data were analyzed using moderated regression analysis. Results showed that learning motivation significantly affected forearm passing ability ($\beta=0.032$, $t=5.882$, $p<0.05$), and the interaction between instructional media and motivation was also significant ($\beta=0.014$, $t=30.464$, $p<0.05$), indicating a moderation effect. Instructional media alone did not significantly affect passing ability ($p=0.256$). These findings suggest that the effectiveness of instructional media in improving forearm passing is contingent on students' level of learning motivation, highlighting the importance of motivation-enhancing strategies in physical education.

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INTRODUCTION

Students sometimes experience difficulties in learning subject matter or mastering other learning tasks. This occurs because they are unable to maintain concentration and attention when teachers deliver instructional material. As teachers, our personalities greatly influence students' learning experiences. By implementing teaching methods or instructional models for students, we indirectly attempt to demonstrate how teaching can be effective for dozens of learners. In addition, our teaching methods influence each student's achievement and success, as every student possesses different characteristics within the school environment. In physical education, teachers must possess appropriate instructional strategies so that the material delivered can be effectively understood by students (Shimon, 2025). Problems arising in every learning process involve students' learning processes, particularly the process of behavioral change through the various experiences they acquire (Hooley, 2022).

The question that arises is: "How do teachers develop and create strategies and manage situations that enable students to engage in the learning process so that they are able to change their behavior?" This issue is closely related to teaching, particularly the activities and responsibilities that teachers must undertake during the instructional process (Efendi & Sauri, 2025; Loewenberg Ball & Forzani, 2009; Metzler, 2017). Fundamentally, teaching is the process of organizing and structuring the environment surrounding students in order to support their development and motivate them to continue learning (Doyle, 2023; Nilson & Zimmerman, 2023). Furthermore, teaching is a process of guiding or assisting students throughout the learning process (Alutu, 2006).

It is also important to consider the variable of students' learning motivation, as motivation represents the internal drive that determines the intensity, direction, and persistence of students in participating in learning activities (Deci & Ryan, 2012; Ntoumanis, 2001; Schunk & DiBenedetto, 2019). High learning motivation has been shown to improve students' focus, effort, and readiness to receive instructional material, including practical physical education content.

At SMA Pasundan Banjaran, students of Grade XII join volleyball lessons, and honestly a lot of them still haven't fully mastered the basic movements in volleyball. As asserted by (Yeri, 2024), volleyball is an intricate sport that fuses flexibility, power, speed, and multiple physical capabilities. Consequently, it establishes its own framework of technical nuances, gameplay aesthetics, and defining characteristics that distinguish it from other athletic pursuits. Volleyball also has several important techniques that are basically part of the game, forearm passing, overhead passing, smashing, blocking, overhand serving, even underhand serving (Hermanzoni et al., 2025; Jariono et al., 2025; Maciejewski & Bobula, 2025). In general, volleyball demands solid agility, since it's a relatively fast, dynamic sport, so the body needs to respond quickly.

In contemporary research, trends in learning motivation studies within physical education have increasingly focused on contextual approaches based on modern curricula. For example, (Firmansyah et al., 2024) analyzed senior high school students' learning motivation in physical education within the framework of the Merdeka Belajar Curriculum and found that autonomy and curriculum relevance significantly contributed to students' motivation. Meanwhile, (Ryan & Deci, 2020), through a literature review from the perspective of Self-Determination Theory (SDT), concluded that game based learning models such as Teams Games Tournament (TGT) and circuit training can optimize students' intrinsic motivation by fulfilling their basic psychological needs (autonomy, competence, and relatedness) (Luo et al., 2020). The novelty of this research compared to previous studies lies in the comprehensive integration of modern curriculum policy frameworks such as the *Kurikulum Merdeka Belajar* (Independent Curriculum) with the psychological mechanisms of Self-Determination Theory (SDT), which transcends the traditional focus that generally measures the effectiveness of instructional methods or media in isolation. While prior research has tended to limit itself to the technical impacts of learning models, such as Team Games Tournament (TGT), on psychomotor outcomes, this contemporary study significantly shifts the paradigm by positioning student autonomy, competence, and relatedness as crucial

variables triggered by curriculum relevance; thus, it provides a profound understanding of how flexible educational structures can serve as primary catalysts for students' intrinsic motivation within the current physical education ecosystem. Furthermore, (Kharisma et al., 2025) found that the Teams Games Tournament (TGT) approach significantly improved learning motivation, self-confidence, and passing ability simultaneously, while emphasizing that innovation in instructional methods is essential for creating active student engagement.

The awareness that many Grade XII students have not yet mastered the fundamental movement of forearm passing encouraged this study to implement instructional media during learning activities. This instructional media is expected to assist students in improving their forearm passing movements in volleyball. The learning media provided to students can help them perform the fundamental forearm passing technique more effectively. Based on the explanation above, it can be concluded that this instructional media requires students to achieve the learning objectives expected by the teacher through the students' learning process.

The urgency of this research is highly critical as instructional media also has the potential to enhance students' learning motivation, as the use of engaging, varied, and relevant media can create more meaningful and enjoyable learning experiences. This is consistent with (Keller, 2009) perspective that appropriate instructional media can enhance students' attention, relevance, confidence, and satisfaction within the (ARCS Attention, Relevance, Confidence, and Satisfaction model, which asserts that the selection of appropriate media can improve students' attention, perceived relevance, self-confidence, and satisfaction during the learning process. Consequently, this research is urgently required to provide evidence-based solutions regarding how systematically designed media can serve as an effective catalyst in fulfilling students' basic psychological needs, which will ultimately have a significant and sustainable impact on the enhancement of their learning motivation.

The objectives of this study are: (1) to determine whether instructional media significantly affects forearm passing ability in volleyball; and (2) to examine whether learning motivation moderates the effect of instructional media on students' volleyball forearm passing ability at SMA Pasundan Banjaran.

METHODS

This study employed a quantitative approach using a quasi-experimental design, specifically the Nonequivalent Control Group Design with a pretest–posttest scheme (Fraenkel et al., 2012). In this design, two groups were involved: an experimental group (which received instructional media treatment) and a control group (which did not receive instructional media or was taught using conventional methods). Variable measurements were conducted before (pretest) and after (posttest) the treatment. This design was selected because the researcher did not perform full randomization of participants, but instead utilized intact groups (volleyball classes) that had already been established.

The study was conducted at SMA Pasundan Banjaran, basically there. The research period was scheduled by following the volleyball timetable for the odd semester, not too complicated. The research sample consisted of 35 Grade XII students, and they were divided into two intact groups:

Table 1. Reseach Design

Group	Class	Number of Students
Experiment	Class XII-A	17 Students
control	Class XII-B	18 Students

Data analysis in this study was performed using IBM SPSS Statistics version 27. Subsequently, validity and reliability tests were conducted to ensure that the research instrument was appropriate for data collection. The validity of the learning motivation instrument was evaluated using the Pearson Product-Moment correlation across 20 items. Validity testing demonstrated that all 20 items were valid, with their respective r -calculations exceeding the r -table benchmark of 0.334 at a significance level of $p < 0.05$. In terms of reliability, the instrument exhibited high internal consistency through Cronbach's alpha method. The analysis produced an alpha value of 0.889; since this score is well above the acceptable 0.70 limit, the instrument is confirmed to be reliable and fit for data collection in this study.

Prior to evaluating the hypotheses, classical assumption tests were performed to verify that the dataset fulfilled the necessary requirements for statistical modeling. Diagnostics for normality, homogeneity, and linearity were executed to evaluate the dataset. The data exhibited a normal distribution pattern, as evidenced by a normality significance value exceeding 0.05. Moreover, equal variances between the experimental and control cohorts were confirmed by Levene's test, which produced a significance value of 0.144 ($p > 0.05$). The linearity constraint was also satisfied, with the Deviation from Linearity test yielding a significance value of 0.430 ($p > 0.05$), thereby verifying the linear association between student motivation and passing gain scores. Based on these verified criteria, the dataset was deemed fully eligible for inferential testing through the Independent Samples t -test and Moderated Regression Analysis (MRA).

RESULTS AND DISCUSSION

A cohort of 35 twelfth-grade students from two intact classes at SMA Pasundan Banjaran was used as the respondents for this investigation. The experiment took place in the 2025/2026 academic year's odd semester, lasting six weeks between January and March 2026. Students in the experimental block (Class XII-A, $n = 17$) took part in media-based learning pathways, while the control block (Class XII-B, $n = 18$) only got conventional instruction. Tables 2 and 3 show a fairly complete view of the empirical data gathered.

Table 2. descriptive statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Pretest	35	3	8	5,51	1,380
Posttest	35	5	10	7,63	1,308
Motivation	35	48	86	67,17	9,519
Gain Score	35	-6	1	-2,11	1,997
Valid N (listwise)	35				

Data from **Table 2.** details the descriptive metrics collected from the 35 participating students. Initial assessments of the volleyball forearm pass produced a mean of 5.51 with a standard deviation of 1.380 (range: 3–8). Upon integrating the media into the learning process, the resulting posttest parameters demonstrated noticeable progress, as evidenced by a mean of 7.63 and a standard deviation of 1.308 (range: 5–10). This statistical shift highlights the advantages of the teaching intervention. For the motivation variable, a mean score of 67.17 was established ($SD = 9.519$, $\min = 48$, $\max = 86$), placing the respondents' learning drive in a satisfactory tier. Furthermore, the calculated gain distribution exhibited a mean of -2.11 ($SD = 1.997$, $\min = -6$, $\max = 1$). Given that the mathematical framework utilized was pretest minus posttest, a higher magnitude in the negative direction indicates a more pronounced optimization of student performance.

Table 3. Hypothesis test results

Variabel	B	t	Sig.	Conclusion
Constant	-2,434	-6,298	0,00	Significant
Media Pembelajaran	0,144	1,158	0,256	Not Significant
Motivation	0,032	5,882	0,00	Significant
Learning Media × Motivation → Lower Passing	0,014	30,464	0,00	Significant

The hypothesis testing presented in **Table 3.** indicates a non-significant main effect for instructional media, which yielded a p-value of 0.256 ($p > 0.05$). Consequently, when controlling for the moderator, instructional media independently does not significantly alter the gain scores. On the other hand, the learning motivation variable demonstrated a robust significance level of 0.000 ($p < 0.05$) and a regression coefficient (beta) of 0.032, substantiating that motivation is a statistically significant predictor of growth in students' volleyball forearm pass skills. Furthermore, the interaction variable (Instructional Media times Motivation) revealed a significance value of 0.000 ($p < 0.05$) with a regression coefficient of 0.014. Consequently, it can be concluded that learning motivation significantly moderates the effect of instructional media on the improvement of volleyball forearm passes. Thus, higher student learning motivation strengthens the effect of instructional media on enhancing forearm pass ability.

The results of this study demonstrate that instructional media exerts a significant effect on improving volleyball forearm pass ability among students at SMA Pasundan Banjaran. Based on the Independent Samples t-test, a significance value of 0.000 ($p < 0.05$) was obtained, thereby supporting the first hypothesis. This finding indicates that the utilization of instructional media effectively assists students in understanding forearm pass techniques compared to conventional learning methods. The improvement in students' abilities is evident from the descriptive analysis, where the mean pretest score increased from 5.51 to 7.63 in the posttest. This indicates that the deployment of instructional media provides a more engaging and active learning experience, facilitating students' comprehension of the fundamental movements in volleyball forearm passing.

The integration of instructional media in physical education has been proven to enhance learning effectiveness, as it offers students a more concrete and enjoyable learning experience. Instructional media encompasses any tool used to convey messages and stimulate students' attention, interest, thoughts, and feelings within the learning process (Febrina & Setiawan, 2024; Lubis et al., 2023; Puhka et al., 2023; Suryani et al., 2022). In this study, the instructional media utilized included suspended balls, rubber balls, cones, modified games, and tennis ball drills. This variety of media helped students gradually grasp the basic techniques of forearm passing, ranging from movement coordination and hand positioning to ball control.

The findings of this study align with (Jufri et al., 2026) and (Mayori et al., 2024), who asserted that the use of educational videos for volleyball forearm passes possesses a high level of feasibility and can significantly enhance student learning outcomes. Additionally, (Saripudin et al., 2025), demonstrated that innovative learning models, such as Teams-Games-Tournament (TGT), can simultaneously enhance students' forearm pass ability, learning motivation, and self-confidence. Thus, the results of this study reinforce the notion that innovative instructional media contributes positively to the development of students' volleyball skills.

Theoretically, the improvement in forearm pass ability occurs because instructional media helps students understand movements in a simpler and sequential manner. In physical education, students require repetitive practical experience to achieve optimal mastery of motor skills (Lucero et al., 2023), (Bailey et al., 2023), and (Roig-Hierro et al., 2024) explained that effective physical education strategies must establish an active learning environment and provide ample opportunities for students to engage in repetitive movement drills. Therefore, the use of modified instructional media in this study helped students feel more confident and eliminated the fear of performing forearm passes.

In addition to the influence of instructional media, the results also indicate that learning motivation significantly affects the improvement of volleyball forearm pass ability. Based on the Moderated Regression Analysis (MRA), the learning motivation variable yielded a significance value of 0.000 ($p < 0.05$). This indicates that students with high learning motivation tend

to be more active, focused, and earnest in physical education sessions. Learning motivation serves as a crucial factor influencing student success in mastering sports skills.

These results support the Self-Determination Theory (SDT) proposed by (Ryan & Deci, 2020), which posits that intrinsic and extrinsic motivation play a pivotal role in enhancing student engagement and performance. Highly motivated students tend to exhibit greater curiosity, enthusiasm for practice, and persistence compared to those with lower motivation. In the context of this study, motivated students participated in forearm pass drills with greater enthusiasm, resulting in a more effective learning process.

Furthermore, the results confirm that learning motivation moderates the effect of instructional media on the improvement of volleyball forearm pass ability. This is evidenced by the interaction variable (MRA), which yielded a significance value of 0.000 ($p < 0.05$). This finding implies that higher student learning motivation strengthens the effect of instructional media on forearm pass enhancement. Conversely, students with low learning motivation tend to be less than optimal in utilizing the provided instructional media.

This finding is consistent with (Herawati et al., 2021), who stated that students with high learning motivation demonstrate greater seriousness and superior learning outcomes compared to their less motivated peers. Moreover, (Jankauskiene et al., 2022; Ntoumanis, 2001) explained that instructional support capable of fostering students' intrinsic motivation positively impacts their participation in physical education activities. Thus, learning motivation functions as a reinforcing factor in the successful application of instructional media.

Based on these research findings, it can be understood that success in physical education is influenced not only by innovative instructional media but also by psychological factors, specifically learning motivation. Physical education teachers need to foster an engaging, active, and enjoyable learning atmosphere to cultivate high learning motivation among students. Utilizing varied instructional media can also serve as a viable solution to enhance students' basic volleyball skills more effectively. Overall, this study implies that integrating instructional media with enhanced learning motivation optimizes students' volleyball forearm pass ability. Therefore, physical education teachers are recommended to utilize various innovative instructional media and pay close attention to student motivation during the learning process to maximize the achievement of physical education objectives.

CONCLUSION

This study concludes that learning motivation significantly influences forearm pass ability in volleyball among twelfth-grade students at SMA Pasundan Banjaran. Furthermore, learning motivation moderates the effect of instructional media on forearm pass ability, implying that instructional media is more effective when students exhibit higher levels of motivation. Conversely, instructional media alone does not exert a significant direct effect on passing ability. These findings suggest that physical education teachers should integrate the utilization of instructional media with motivation-enhancing strategies to optimize learning outcomes. Future research is recommended to explore the specific roles of distinct instructional media types (e.g., video tutorials, interactive applications) and to expand the sample size across multiple schools to enhance generalizability.

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