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The Effect of Music-Based Pencak Silat Training on The Learning Motivation of Vocational High School Students In Physical Education Classes

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A B S T R A C T S

This study aims to analyze the effect of music-rhythm-based pencak silat training on the learning motivation of vocational high school (SMK) students in the Physical Education, Sports, and Health (PJOK) course. This study employed a quantitative approach with a single-group pretest-posttest design involving 20 10th-grade students at SMK Sejahtera in Surabaya. Data were collected through measurements of learning motivation before and after the intervention, then analyzed using the Shapiro-Wilk normality test and a paired-sample t-test. The average motivation score increased from 105.55 to 109.15, a difference of 3.60 points. The results of the normality test showed a significance value of 0.096, while the paired-sample t-test yielded a t-value of 1.797 and a significance value of 0.088. Although the average learning motivation score increased after the intervention, the difference was not statistically significant ($p = 0.088$). Therefore, the research results should be interpreted with caution. Music-based pencak silat exercises can be considered a potential variation in physical education instruction. However, further research with a larger sample size and a comparison group is needed to determine its effectiveness more conclusively.

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INTRODUCTION

Physical Education, Sports, and Health (PJOK) is an important component of education that supports the achievement of learning objectives as well as students' physical, mental, and social development (Subagja et al., 2024). PJOK instruction is not only focused on developing motor skills and physical fitness but also supports the development of mental and social aspects, discipline, responsibility, and the ability to collaborate. Therefore, the quality of PJOK instruction should be assessed based on how actively students participate, understand the objectives of the activities, and gain meaningful learning experiences. PJOK instruction involves various movement activities and games designed to improve fitness while fostering positive attitudes in students (Tristan et al., 2026). One of the subjects in Physical Education (PJOK) that can support these objectives is pencak silat. Pencak silat is a martial art that has evolved within Indonesian culture and incorporates elements of motor skills, self-control, discipline, and social values. In essence, pencak silat is not merely a martial art but also a means of developing mental and physical aspects to foster agile human resources capable of internalizing and actualizing the noble moral values of society (Hidayati et al., 2024).

Furthermore, pencak silat serves as one of the elements of Indonesian culture that can encourage students to recognize, appreciate, and cherish the nation's cultural heritage (Rachman et al., 2021). The introduction of pencak silat in educational settings can thus support motor skill development while fostering an appreciation for the nation's culture. However, in practice, the implementation of pencak silat instruction in educational institutions may face challenges such as limited student interest and active engagement when learning activities are conducted in a monotonous manner, which can lead to boredom and reduced motivation to learn (Sudirman et al., 2026). Motivation to learn is a key factor in this context. Motivation is related to student engagement and can be influenced by factors such as teacher support and students' perceptions of their own abilities (Guo et al., 2025). In Physical Education (PJOK) classes, motivation can be observed through a student's willingness to follow instructions, try out movements, practice earnestly, ask questions when they do not understand a technique, and participate alongside peers. Motivation is not the sole determinant of learning success, but it can be related to how students make use of available learning opportunities. Motivation to learn can be influenced by factors within the student as well as environmental factors (Xu et al., 2025). Interest in the subject matter, prior experience, a sense of competence, and personal goals can all be related to students' willingness to engage. On the other hand, teacher support, interactions with peers, the availability of facilities, a variety of activities, and the classroom atmosphere can also play a role. Because these factors are interrelated, efforts to increase motivation cannot rely on just one aspect of the learning process. Teachers need to design activities with clear objectives,

provide opportunities for practice tailored to students' abilities, and offer feedback that encourages students to improve their movements without fear of making mistakes. These conditions highlight the need for pedagogical innovation to optimize students' interest and engagement during the pencak silat learning process. One alternative approach that has the potential to create a more engaging learning environment is the use of music or rhythm in movement activities (Rahmawati et al., 2026). Music can create a pleasant and comfortable atmosphere and help combat boredom, boost energy and self-confidence, and reduce stress and anxiety (Hendriawan et al., 2025).

In the context of pencak silat, musical rhythm can be used to accompany the basic movements that students have learned. The beat can serve as a rhythmic cue when performing simple movement sequences, changing positions, or practicing coordination. However, pencak silat still requires technical precision, body control, understanding of instructions, and attention to safety. Music must not interfere with the instructor's explanations, drown out safety cues, or encourage students to move faster than their technical ability allows. Therefore, the integration of music should serve as a support for the exercises, not a substitute for teaching technique and safety principles. The use of music in physical activities shows potential for enhancing student motivation and engagement. Pencak silat instruction still tends to be teacher-centered and rely on demonstration methods, and there has been limited research on the application of music-based rhythm exercises to student learning motivation (Handayani et al., 2021). The development of pencak silat instruction is also being implemented through the use of technology-based media, such as Android apps (Harahap & Sinulingga, 2021). The use of music in physical education has also shown positive results; for example, the use of electronic dance music has significantly contributed to increased motivation and enthusiasm among students in athletics classes (Bara et al., 2024). Increased student motivation has also been observed through rhythmic gymnastics activities accompanied by music (Prasty et al., 2025). Meanwhile, the use of digital music can boost students' enthusiasm and participation in physical activities (Surur et al., 2025). Research on student motivation in the Tapak Suci pencak silat extracurricular program has also been conducted, but it has not yet tested the use of specific training methods as interventions (Mustaqim et al., 2025). In addition, students' interest in learning rhythmic gymnastics is relatively high, although more varied teaching strategies are still needed (Anasih et al., 2024). Research on students' interest in pencak silat instruction at vocational high schools has also been conducted using a survey method (Prayogo, 2020). However, studies that specifically integrate rhythmic music into pencak silat training and examine its impact on the dynamics of vocational high school students' learning motivation in physical education classes remain very limited. Therefore, this study was conducted to address this research gap.

The novelty of this study lies in the application of pencak silat martial arts training combined with musical rhythm as an innovative approach to physical education to enhance the learning motivation of vocational high school students. Unlike previous studies that examined motivation in pencak silat extracurricular activities or applied musical rhythms to taekwondo training, this study integrates musical rhythms directly into pencak silat training within the context of Physical Education and Health (PJOK) instruction at vocational high schools. The use of musical rhythms is expected to create a more conducive and varied learning environment, thereby stimulating student engagement and motivation. Based on this novelty, this study aims to identify the effect of music-rhythm-based pencak silat training on the learning motivation of vocational high school students in Physical Education and Health (PJOK) classes.

THEORETICAL FRAMEWORK

Learning motivation refers to the internal and external factors that drive students to participate in learning activities, maintain their engagement, and achieve learning objectives. In physical education, motivation plays a crucial role because students' willingness to participate can influence their interest, effort, and engagement during learning activities. One theoretical perspective that explains learning motivation is Self-Determination Theory (SDT), developed by Deci and Ryan. This theory emphasizes three basic psychological needs: autonomy, competence, and relatedness. Autonomy refers to students' sense that they have choices and control over learning activities. Competence relates to students' belief in their ability to complete tasks well, while relatedness refers to the feeling of being accepted and connected to others. When these needs are met, students tend to develop autonomous motivation and become more actively engaged in learning (Maulana et al., 2016; Meng & Liu, 2026). In this study, students' learning motivation was assessed using questionnaire scores collected before and after the instructional intervention. These scores were used to describe changes in students' motivation following the implementation of music-based pencak silat training. The interpretation of motivation scores must be based on the indicators and scoring procedures of the questionnaire used in this study.

Music can be used as a supportive element in physical education because rhythm and sound can create a more engaging learning environment. Music can help students maintain their interest, provide a rhythm during physical activities, and make learning activities more enjoyable. During physical activities, music can also provide rhythmic cues that help regulate movement and create a more structured workout environment. However, the use of music does not automatically guarantee increased motivation to learn. Its effectiveness may depend on the appropriateness of the music, the learning activity, and how the teacher integrates music into the learning process. Pencak silat is a physical activity that involves

coordination of movement, technique, discipline, and concentration. During the learning process, students are required to understand and practice various movements systematically. Integrating music into pencak silat training can provide rhythmic support during movement practice and create a more varied learning environment. From the perspective of Self-Determination Theory, a more engaging learning environment can foster students' interest and willingness to participate. Music-based training can also provide students with the opportunity to experience movement practice in a more enjoyable and structured way. In the context of vocational high school students, music-based pencak silat training can be considered as an alternative learning approach to support students' learning experiences and motivation in physical education. However, the relationship between music-based training and learning motivation still needs to be examined through empirical evidence. Therefore, this study examines changes in students' learning motivation before and after participating in music-based pencak silat training.

METHOD

This study employed a quantitative approach using an experimental method and a one-group pretest–posttest design. In this design, a single group of participants was assessed before the intervention, then underwent the intervention, and was subsequently reassessed using the same instrument. Changes in scores between the pretest and posttest were used to describe changes in learning motivation following music-based pencak silat training. Since the study did not involve a comparison group, this design can demonstrate changes within the observed group but has limitations in ensuring that these changes were caused solely by the intervention. This study was conducted at SMK Sejahtera in Surabaya, Indonesia. The study participants consisted of 20 10th-grade students who were enrolled in the Physical Education, Sports, and Health (PJOK) course and participated in the study. Participants were selected using purposive sampling based on the class's suitability for the study's objectives and the available research arrangements. Individual sociodemographic information, such as age and gender, was not available in the research records and therefore could not be reported. Consequently, the sample was not randomly selected from the entire student body; thus, the generalizability of the findings must be limited to similar contexts and does not necessarily represent all vocational high school students.

The research procedure consisted of a pretest, the intervention, and a posttest. In the initial stage, participants completed a learning motivation questionnaire as a pretest. Afterward, participants took part in pencak silat training combined with musical rhythms over several sessions, as outlined in the lesson plan. After the intervention, participants completed the same learning motivation instrument as a posttest. The difference between the pretest and posttest scores was then analyzed to assess the direction and magnitude of changes in motivation scores. The study consisted of pencak silat training accompanied by music during

physical education classes. The training was conducted over 4 sessions, with each session lasting 120 minutes. The music used during the intervention was traditional music. The training activities included the ready stance, horse stance, blocking stance, kicks, strikes, and parries. Each session followed the procedures strictly implemented during the study, including warm-ups, core training activities, and cool-downs. Music was played during every session to accompany the training activities.

The research intervention consisted of pencak silat training accompanied by music. Conceptually, music was used as a complementary element to the training to create variety in the atmosphere and rhythm of the activity. However, responsible implementation must still prioritize the accuracy of movements, the instructor's instructions, the participants' abilities, and safety. The observed variables were the learning motivation scores before and after the intervention. The same learning motivation instrument was used for both measurement time points. Data analysis was conducted using descriptive statistics and inferential analysis. Descriptive statistics were used to present the number of participants, the minimum and maximum scores, the mean, and the standard deviation of the pretest and posttest scores. Next, the Shapiro–Wilk test was used to check the normality of the distribution of the pretest and posttest score differences. Since the main test compared two measurements from the same participants, the analysis continued with a paired-samples t-test. The significance level used was 0.05. A p-value greater than 0.05 is interpreted as a lack of sufficient statistical evidence to indicate a significant difference at that level; this result does not equate to evidence that there was absolutely no change or no potential benefit.

RESULTS AND DISCUSSION

RESULTS

A descriptive analysis was conducted on data from 20 students who took the pretest and posttest. As shown in Table 1, the mean score for learning motivation on the pretest was 105.55 with a standard deviation of 10.660. On the posttest, the mean score increased to 109.15 with a standard deviation of 13.327. Thus, there was an average increase of 3.60 points after the participants took part in music-based pencak silat training. The minimum and maximum scores on the pretest were 90 and 132, respectively, while on the posttest they were 97 and 132, respectively.

Table 1. Results of the Descriptive Analysis of the Pretest and Posttest

Variabel	N	Minimum	Maximum	Mean	Std. Deviation
Pretest	20	90	132	105,55	10,660
Posttest	20	97	132	109,15	13,327

Descriptively, the increase in the mean indicates that the group's motivation score at the end of the assessment was higher than the initial score. However, the group mean does not capture the full range of individual student responses. The posttest standard deviation, which is larger than the pretest standard deviation, indicates a wider distribution of final scores within this group. Therefore, changes in the mean must be interpreted in conjunction with the results of inferential tests and should not be used as the sole basis for declaring the treatment a success.

A normality test was conducted on the difference scores between the pretest and posttest. As shown in Table 2, the test yielded a p-value of 0.919 with a significance level of 0.096. Since the significance level is greater than 0.05, there is insufficient statistical evidence to reject the assumption of normality for the difference scores. Based on these results, the analysis of differences proceeded with a paired-samples t-test.Table 2. Results of the Normality Test for the Difference Data

Variabel	**Shapiro-Wilk**	**Sig.**	**Description**
Selisih *Pretest-Posttest*	0,919	0,096	Normal

The results of the paired-samples t-test in Table 3 show a mean difference of −3.600 for the comparison of pretest minus posttest, a t-value of −1.797, 19 degrees of freedom, and a two-tailed significance value of 0.088. The negative value for the pretest–posttest difference is consistent with the posttest mean being higher than the pretest mean. However, the p-value of 0.088 is greater than the significance threshold of 0.05. Thus, this difference in scores has not reached statistical significance.

Table 3. Results of the Paired-Sample t-Test

Comparison	**Mean Difference**	**t**	**df**	**Sig. (2-tailed)**
Pretest – Posttest	-3,600	-1,797	19	0,088

These results must be interpreted in context. The data indicate a positive trend in the average change, but the statistical evidence obtained is not yet sufficient to conclude that there is a significant difference at the 5% level. A p-value greater than 0.05 does not mean that the intervention is definitely ineffective. Rather, the results indicate that, based on the data and the design of this study, the observed changes cannot yet be reliably distinguished from variations that might occur by chance. Studies with a larger sample size, more detailed measurements, and a control group could help clarify the results.

DISCUSSION

A balanced interpretation is important so that the results are not exaggerated and continue to reflect the available data. From a pedagogical perspective, pencak silat exercises based on musical rhythm are one variation that can be tried in physical education classes. Music can provide a rhythmic cue, create a more dynamic atmosphere, and make the activity more engaging for some students. When movements are performed in a structured sequence, rhythm can help maintain the continuity of the activity and provide a learning experience that differs from typical exercise routines. However, these benefits are potential advantages that need to be adapted to the specific learning context.

A number of studies have shown that music can be linked to emotional experiences and the learning process. Music offers benefits for students' learning development, particularly in relation to emotional aspects, memory, concentration, and the learning process (Suci, 2019). The use of music during physical exercise is known to support fitness while also influencing students' mood states (Gustiansyah et al., 2026). Music can affect students' motivation and emotional states during the learning process (Avandra et al., 2023). The use of musical accompaniment in the Physical Education and Health (PJOK) instructional process has been shown to optimize students' intrinsic motivation and positive emotional responses (Cools et al., 2023). The use of musical cues in physical activity programs can increase student motivation and participation (Jeong et al., 2020). The use of music as a learning medium also demonstrates that music has the potential to foster a transformative and conducive learning process and to help address low student motivation (Batu et al., 2021). Additionally, warm-up activities accompanied by music can increase students' active participation (Nulhakim et al., 2025). Theoretically, music can make physical activity feel more enjoyable and reduce the perception of fatigue. Music can influence emotions, reduce the perceived effort required, and support physical performance (Park et al., 2023). A review of the literature found that music can create a more enjoyable learning atmosphere and can influence students' motivation and emotional state (Irawana & Desyanri, 2019).

Although the average learning motivation score increased after the intervention, the results of the paired-samples t-test did not show a statistically significant difference ($p = 0.088$). These findings suggest that the observed increase was not sufficient to prove a significant improvement in students' learning motivation. One possible explanation is that music may already be familiar in some Pencak Silat training environments. If students had previously participated in Pencak Silat training accompanied by music, its use during the intervention may not have provided enough new stimulation to significantly alter their motivation. However, this explanation remains tentative because students' prior experiences with music-based Pencak Silat training were not specifically examined in this study.

However, research findings do not always show the same effects. A meta-analysis found that music provides some benefits for performance and psychological responses, but the magnitude of these effects can vary across conditions (Delleli et al., 2023). The effects of music on affective responses and cognitive function during physical activity remain context-dependent and inconsistent (Danso et al., 2026). Interest, coaches, the environment, and facilities may be factors related to students' motivation in pencak silat (Sholeh & Winarno, 2023). This may explain why this study found an increase in average motivation, but the difference was not yet statistically significant. This outcome is understandable because motivation to learn pencak silat is not solely influenced by the use of music. Vocational high school students' motivation in pencak silat learning is related to intrinsic factors (Kurniawan et al., 2022). The findings also indicate that music is best viewed as a supporting factor in learning, rather than the sole determinant of motivation. Rhythmic music can be incorporated into innovative Physical Education and Health (PJOK) instruction to create an interactive and enjoyable learning experience (Putra et al., 2025). Thus, music is best positioned as one of the factors supporting learning that needs to be integrated with appropriate methods, environments, student characteristics, and instructional management. The results of this analysis confirm some of the previous empirical findings demonstrating the benefits of music, but they also show that music is not the sole factor determining learning motivation. Differences in results may be influenced by the type of music, duration of practice, student characteristics, the learning atmosphere, and the instructional methods used. Responses to music in sports can be influenced by musical preferences and participant characteristics (Niering et al., 2026).

This study has several limitations that should be considered when interpreting the results. First, the study involved only 20 students from a single class, which limits the generalizability of the findings. The relatively small sample size may also limit the study's ability to detect statistically significant changes in learning motivation. Second, the use of a one-group pretest–posttest design without a control group makes it difficult for the researcher to determine whether the observed changes were specifically caused by the music-based Pencak Silat training or by other factors during the study period. Third, students' perceptions of enjoyment, engagement, and the suitability of the music were not measured separately. Additionally, students' prior experiences with music-based Pencak Silat training were not examined. Future research is recommended to involve a larger sample from multiple classes or schools and to include a control group to obtain stronger evidence. Researchers are also advised to use more detailed measurements, including students' perceptions of the music, enjoyment, engagement, and their prior experience participating in music-based Pencak Silat training.

CONCLUSION

In this study, music-based pencak silat training has not been confirmed to have a significant effect on the level of learning motivation among vocational high school students in physical education classes. Nevertheless, the use of music still has the potential to serve as a supporting factor in making the learning process more engaging and enjoyable, as well as in increasing student engagement in the learning process. Learning motivation is influenced not only by music but also by students' interests, the learning environment, facilities, student characteristics, musical preferences, practice duration, and the teaching approaches employed. Based on this, the use of musical rhythms in pencak silat instruction can be considered as a teaching variation; however, it should be combined with other instructional strategies to achieve optimal results.

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