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# Effect of Implementation Technological Enchanced Learning in Physical Fitness Material on Student Learning Motivation

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## Abstract

This study presents an analysis of the effect of the application of Technological Enhanced Learning (TEL) in physical fitness material on student learning motivation at Junior High School 3 Cileunyi. The research design used was a one-shot case study with a control group, involving 40 students who were divided into experimental and control groups. The instrument used was a questionnaire to measure students' learning motivation, including aspects of interest, involvement, and drive to learn. The results showed a significant increase in the learning motivation of students who participated in technology-based learning compared to the control group, who used conventional methods. Statistical analysis using the independent T-test indicated that the application of TEL can positively influence students' learning motivation. The findings support the theory that interactive learning experiences can increase student motivation, as well as making an important contribution to the development of pedagogy in physical education. This study recommends the use of technology as an innovative solution to improve student engagement and learning quality in physical fitness materials. Future research is recommended to expand the research sample to provide a clearer picture of the effectiveness of TEL.

## How to Cite

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## INTRODUCTION

Physical education has an important role in the physical and mental development of students (Jasmani et al., 2024). However, many students lack motivation to engage in physical fitness activities, which may affect their health and academic performance. In this context, the application of Technological Enhanced Learning (TEL) emerges as an innovative solution to increase students' learning motivation (Nela, 2021). TEL integrates modern technology in the learning process, thus creating a more engaging and interactive learning experience (Permana, 2024).

The problem to be investigated in this study is how the application of TEL can affect students' learning motivation in physical fitness materials. Many studies show that the use of technology, such as educational apps and online learning platforms, can increase student engagement and make learning more enjoyable (Penelitian et al., n.d.). According to (Hamari et al., 2019), gamification and the use of technology in education can encourage students to actively participate in learning. In addition, research by revealed that TEL can increase students' desire to learn, especially in a more interactive context.

The use of technology in learning is believed to be one of the solutions to increase student learning motivation. With technology, learning becomes more interactive and interesting, so it can captivate students' attention (budiono, 2024) . For example, the use of multimedia, learning videos, and simulations can make the subject matter easier to understand and interesting for students. In addition, technology also enables project-based and collaborative learning that can increase students' involvement in the learning process (Depita, 2024).

Active Arcade adalah is an innovative app that combines physical activity with game elements. (Fitur et al., 2020). In the context of this research, Active Arcade serves as an engaging tool to increase students' motivation to learn about physical fitness. By offering a variety of interactive games that require physical movement, such as running, jumping, or dancing, the app not only makes sports activities more fun but also encourages students to actively participate.

Active Arcade can be used in class in a fun and interactive way. First, teachers can add this app to their physical education curriculum by starting sessions with the games it offers. For example, before starting physical activities, teachers can show tutorial videos from the app that explain certain sports techniques. Students are then split into groups and given challenges to compete in physical activities, like running, jumping, or team games. In each session, students can use the tracking feature to monitor their progress, such as the number of calories burned and exercise time. After the activity, teachers can hold a discussion to provide feedback based on the data obtained from the app so students can understand areas that need improvement.

Additionally, Active Arcade allows the use of gamification features by rewarding students with points or badges for achieving specific goals, thereby encouraging further engagement. The platform, available on Android and iOS devices, supports collaborative activities, where students can work in groups to complete specific missions within the app, such as overcoming obstacles or time challenges. At the end of the learning period, teachers can conduct evaluations using data from the app to assess student progress and provide tailored exercise recommendations.

The selection of Active Arcade as a learning tool is based on several reasons. First, the app offers a highly interactive learning experience, making students more engaged and motivated. Its flexibility in various settings, both in the classroom and outdoors, supports a dynamic learning approach. With gamification elements, Active Arcade leverages proven theories effective in increasing student engagement. In addition, the personalization feature allows students to customize their avatars and choose game levels according to their abilities, making the learning experience more interesting and relevant. The app also provides analytics for teachers, allowing them to see students' overall progress, which helps in planning more effective lessons. More extensive and diverse, and supports more flexible and adaptive learning methods tailored to the individual needs of students (Suwahyu, 2024). Learning motivation is one of the key factors influencing students' academic success. Learning motivation refers to students' desire, effort, and internal drive to achieve learning goals (Sartipa & Munisah, 2023). Students with high learning motivation tend to be more enthusiastic and diligent and have a strong curiosity about the subject matter. Conversely, students with low learning motivation often exhibit passive attitudes, lack enthusiasm, and quickly become bored during the learning process (Belajar & Didik, 2025). Low student learning motivation can also be determined by the teacher's teaching skills and student activities during the learning process (Rahayu & Fajrie, 2021) . Teachers often prefer to use books as the primary medium in learning, which results

in learning becoming less interesting and monotonous. This impacts student learning motivation (Afidah et al., 2022) . Monotonous learning activities will cause students to lose interest and feel bored with the learning provided by teachers. Passive learning will affect students' learning motivation (sekarwangi, 2024).

Previous studies discussing the influence of learning technology on student learning motivation have shown positive results and support the application of technology in the learning process. (Maharani & Attaqiy, n.d.) They state that technology can serve as a bridge to increase student enthusiasm and motivation to learn. This increase in learning motivation has a direct positive impact on student learning outcomes. Motivated students tend to be more diligent, enthusiastic, and ultimately capable of achieving higher academic achievements, according to research (Rahma et al., 2024). This study aims to analyze the influence of technology application in learning (technological enhanced learning) on students' learning motivation in physical fitness material (Maria et al., 2023). By utilizing various digital tools and applications, this study seeks to explore how technology can enhance students' engagement and enthusiasm in learning, thereby contributing to the improvement of physical education quality (Tahsinia et al., 2024).

The use of technology in physical fitness education, such as innovative media and game-based approaches, has been proven effective in increasing students' motivation to learn about physical fitness (Sari et al., 2023). This approach aims to create a more engaging and enjoyable learning experience, which ultimately fosters students' enthusiasm to become more involved in physical fitness activities.

To add novelty to this research, to integrate wearable technology, such as smartwatches, which can monitor students' physical activity and provide immediate feedback, thus increasing their engagement in learning. In addition, the use of artificial intelligence (AI) in apps such as Active Arcade can provide a personalised learning experience, adjusting challenges based on students' progress. Long-term research is also important to observe the effects of using Technology Enhanced Learning (TEL) on learning motivation and academic performance. Parental and community involvement in supporting the use of TEL, as well as the implementation of more complex gamification in the application, will further strengthen the positive impact on student motivation. With the addition of these novel elements, research can make a significant contribution to the development of physical education pedagogy.

## METHODS

This research method uses a one-shot case study design with a control group, which allows researchers to provide interventions to the experimental group and compare them with the control group that did not receive the intervention (Darmawati & Hidayati, n.d.). This design involves a single observation (post-test) after the intervention is given to the experimental group.

The study was conducted at Junior High School 3 Cileunyi, which was selected because it has a physical fitness program relevant to the application of Technological Enhanced Learning. The study population consisted of all students at the school, with samples randomly selected from two classes—one class as the experimental group comprising 20 students applying technology-based learning methods and one class as the control group also comprising 20 students using conventional methods.

The instrument used was a questionnaire designed to measure students' learning motivation, covering aspects such as interest, engagement, and motivation to learn (Motivasi et al., 2021). The approach applied was quantitative, where the data collected was analyzed statistically to see the effect of the application of Technological Enhanced Learning on learning motivation (Empati et al., 2024).

The research procedure includes preparing questionnaires, implementing interventions in the experimental group, and administering questionnaires before and after the intervention. The data obtained will be analyzed using descriptive and inferential statistical techniques to determine the significant effect of technology implementation on the learning motivation of eighth-grade students at Junior High School 3 Cileunyi. With this method, it is hoped that the research can provide better insights into how technology can improve learning motivation in the context of physical fitness (A enni, 2022).

## RESULTS AND DISCUSSION

**Table 1.** Demographics of research results

| characteristics | control | experiment |
|---|---|---|
| Age | 13-15 years old | 13-15 years old |
| Male | 13 | 11 |
| Female | 7 | 9 |

The table above shows the demographics of the study results, divided into two groups: control and experimental, with participants aged between 13 and 15 years. In the control group,

there were 13 males and 7 females, while in the experimental group, there were 11 males and 9 females. This data reflects a relatively balanced gender composition in both groups, although the control group had more males, while the experimental group had more females. This is important to analyze further in the context of the influence of the learning methods applied on students' motivation and learning outcomes.

The results of normality testing using two methods, namely Kolmogorov-Smirnov and Shapiro-Wilk, for two data groups: pretest and posttest. For the pretest group, the Kolmogorov-Smirnov statistic value is 0.098 with a p-value (Sig.) of 0.200, indicating that the data is normally distributed. The Shapiro-Wilk results for the pretest show a statistic value of 0.966 with a p-value of 0.666, which also indicates a normal distribution. For the posttest group, the Kolmogorov-Smirnov value is 0.093 with a p-value of 0.200, and the Shapiro-Wilk value is 0.973 with a p-value of 0.822, both indicating that the posttest data is also normally distributed. These results are important for ensuring the validity of the statistical analysis to be conducted subsequently.

The results of the Levene's test for homogeneity of variances using four approaches: based on the mean, median, median with adjusted degrees of freedom, and trimmed mean. The Levene statistic value is 2.527 for the mean-based approach with a p-value (Sig.) of 0.064, which is close to the significance threshold but not sufficient to reject the null hypothesis. The median-based and median-based with adjusted degrees of freedom approaches each have a value of 2.265 with p-values of 0.088 and 0.089, respectively, which also indicate no strong evidence for variance differences. The final approach, based on the trimmed mean, yielded a value of 2.530 with a p-value of 0.063. Overall, all p-values indicate that there is insufficient evidence to conclude that the variances between groups differ significantly, which is important for further analysis.

The results of the independent samples t-test show that there is no significant difference between the two groups compared in the post-test measurement, with the Levene's test for equality of variances showing a p-value of 0.328, which is greater than 0.05, so the assumption of equal variances can be accepted. The t-value for the comparison of means is -11.250 with degrees of freedom (df) of 38 and a p-value (Sig. 2-tailed) of 0.000, indicating that the difference between the two groups is highly statistically significant. The mean difference is -11.250 with a standard error of difference (Std. Error Difference) of 4.694. The 95% confidence interval for the mean difference is in the range of -20.206 to -2.294, which does not include zero, confirming that this difference is significant and indicating that the compared groups have significantly different results. This study shows that the implementation of Technological Enhanced Learning (TEL) in physical education materials has a significant impact on the learning motivation of students at Junior High School 3 Cileunyi. The results of the analysis using the independent samples t-test indicate a significant difference between the group implementing technological enhanced learning (TEL) and the control group in the post-test measurement. Levene's Test shows a p-value of 0.328, supporting the assumption of equal variances between the two groups. The t-value obtained is -11.250 with 38 degrees of freedom and a p-value (Sig. 2-tailed) of 0.000, confirming that the difference between the two groups is highly statistically significant. The results of the t-test indicate that the implementation of Technological Enhanced Learning (TEL) significantly improves students' learning motivation, as evidenced by the statistically significant mean difference between the TEL group and the control group, reflected in a p-value of 0.000, which indicates a very high level of significance.

The average difference between the experimental and control groups is -11.250, with a standard error of difference of 4.694. The 95% confidence interval for the average difference ranges from -20.206 to -2.294, which does not include zero. This indicates that the implementation of TEL has a significant positive impact on student learning motivation, suggesting that students engaged in technology-based learning show higher motivation than those following conventional methods.

The results of this study are in line with learning motivation theory, which states that interactive learning experiences can increase student motivation (Sartipa & Munisah, 2023). Research by (Hamari et al., 2019) reinforces these findings, confirming that gamification and technology in education can encourage active student participation. By utilizing educational applications and multimedia, students demonstrate higher levels of motivation, consistent with previous research by (Nela, 2021) and (Maharani & Attaqiy, n.d.)

However, the insignificant results of the second measurement correct the view that all educational interventions necessarily produce

consistent results. This shows that the effectiveness of interventions can vary depending on the context and timing of measurement, providing new insights into the understanding of TEL implementation.

This study makes a significant contribution to the development of pedagogy in physical education. By demonstrating that TEL can increase student motivation, this study offers educators a new approach to improving the quality of learning. Higher student engagement is expected to not only increase motivation but also overall academic performance (Rahmadianti, 2019). These findings can also be used as a reference in designing more effective intervention programs in the future.

In addition, the implementation of TEL also provides new insights into the importance of adapting learning methods to students' needs. In the context of physical fitness, applications such as Active Arcade can make learning more enjoyable and relevant for students. Their involvement in physical activities through digital platforms not only increases motivation but also strengthens social and collaborative skills (Siswa, 2024). Therefore, this study recommends that schools further explore the use of technology in learning to improve the quality of physical education and facilitate the overall character development of students (Melati et al., 2023).

## CONCLUSION

This study shows that the application of Technological Enhanced Learning (TEL) in physical education significantly improves student motivation at Junior High School 3 Cileunyi. The results of the analysis show a significant difference between the experimental group, which used technology-based learning methods, and the control group, which used conventional methods. The increase in learning motivation among students engaged in interactive learning experiences reinforces the theory that technology can positively contribute to physical education. These findings provide practical guidance for educators to integrate technology into the learning process and suggest further research to explore the factors influencing the effectiveness of TEL implementation and its long-term impact on students' academic outcomes.

This study also highlights the importance of professional training and development for teachers in implementing technology in learning. A deep understanding of the tools and applications used is necessary for technology-based teaching to run effectively and have a positive impact on student motivation. By improving teachers' skills, it is hoped that they can create a more dynamic and interactive learning environment.

Additionally, the results of this study indicate the need for parental and community involvement in supporting the application of technology in physical education. Collaboration between schools, parents, and the community can create a more supportive learning ecosystem, thereby motivating students and increasing their involvement in the learning process. With strong support from various parties, the effectiveness of technology-enhanced learning can be further enhanced, and the goals of physical education can be better achieved.

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