



Application of video animation to increase students' interest and physical skills in primary school physical education

Aplicación de la animación de vídeo para aumentar el interés y las habilidades físicas de los alumnos en la educación física de la escuela primaria

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Abstract

Introduction: The use of animated videos in physical education learning in primary schools has great potential in improving students' motivation and motor skills. The background of this study stems from the problem of low levels of student participation in physical education lessons, which is often caused by students' lack of motivation and understanding of the physical movements being taught.

Objective: To overcome this problem, this study aims to evaluate the effectiveness of using animated videos in increasing motivation as well as basic motor skills of lower grade elementary school students.

Methodology: The method used in this study was a true experimental design with two groups, namely the experimental group that used animated videos as learning media and the control group that did not use this media. Data were collected through motor skill tests and motivation questionnaires, then analysed using the N-Gain test to measure the difference between pre-test and post-test results.

Results: The results showed that the use of animated videos significantly contributed to improving basic motor skills as well as students' motivation to participate in physical education activities. Animated videos allow students to see and understand physical movements more clearly, which makes it easier for them to practice them. In addition, attractive animated videos are also able to increase students' level of engagement in the lesson.

Conclusions: In conclusion, the application of animated videos in physical education learning is effective for improving students' motivation and basic motor skills. Therefore, the use of this technology can be an effective solution in improving the quality of physical education in primary schools.

Keywords

Animated video; physical education; motor skills; student motivation; interactive learning.

Resumen

Introducción: El uso de vídeos animados en la enseñanza de educación física en escuelas primarias tiene un gran potencial para mejorar la motivación y las habilidades motoras de los estudiantes. El trasfondo de este estudio surge del problema de los bajos niveles de participación de los estudiantes en las clases de educación física, que a menudo se debe a la falta de motivación y comprensión de los movimientos físicos que se enseñan.

Objetivo: Para superar este problema, este estudio pretende evaluar la eficacia del uso de vídeos animados para aumentar la motivación y las habilidades motoras básicas de los alumnos de primaria de cursos inferiores.

Metodología: El método utilizado en este estudio fue un diseño experimental real con dos grupos, a saber, el grupo experimental que utilizó vídeos animados como medio de aprendizaje y el grupo de control que no utilizó este medio. Los datos se recopilaron mediante pruebas de habilidades motoras y cuestionarios de motivación, y luego se analizaron utilizando la prueba N-Gain para medir la diferencia entre los resultados de la prueba previa y la prueba posterior.

Resultados: Los resultados mostraron que el uso de vídeos animados contribuyó significativamente a mejorar las habilidades motoras básicas, así como la motivación de los estudiantes para participar en actividades de educación física. Los vídeos animados permiten a los estudiantes ver y comprender los movimientos físicos con mayor claridad, lo que les facilita practicarlos. Además, los vídeos animados atractivos también pueden aumentar el nivel de participación de los estudiantes en la lección.

Conclusiones: En conclusión, la aplicación de vídeos animados en el aprendizaje de la educación física es eficaz para mejorar la motivación de los estudiantes y las habilidades motoras básicas. Por lo tanto, el uso de esta tecnología puede ser una solución eficaz para mejorar la calidad de la educación física en las escuelas primarias.

Palabras clave

Vídeo animado; educación física; habilidades motoras; motivación del estudiante; aprendizaje interactivo.



Introduction

Physical education is an important aspect of the primary education curriculum that contributes to children's motor, cognitive and social development. In particular, lower primary school students are at a critical developmental stage where they begin to develop basic motor skills that will form the foundation for their future physical activity. Previous research shows that active participation in physical education can improve students' physical and mental health and promote their social development (Li, 2023; Saeed et al., 2023). However, in practice, many lower primary students show a lack of motivation in participating in PE lessons, which can negatively affect their physical development. Factors such as uninteresting teaching methods, lack of student engagement, and unsupportive learning environments are some of the main causes of students' low enthusiasm for physical activity (Manzano-Sánchez, 2023; Prado-Botana, 2023).

One approach that can increase students' motivation and participation in physical education is to adopt more innovative and interactive learning methods. Technology-based learning media, such as animated videos, have been shown to increase student interest and engagement in various fields of education (Wiguno et al., 2023; Yoluut et al., 2024). Animated videos offer a combination of visual and audio elements that can present material in a more interesting and understandable way for students. In the context of physical education, the use of animated videos can help students understand movements better and increase their engagement in sports activities. Studies show that multimedia-based learning approaches can improve students' understanding of concepts and motor skills, which in turn has an impact on improving their academic and physical performance (Jadmiko, 2024; Setyawan et al., 2022). The main problem faced in physical education in lower primary schools is the low level of student participation in physical activity. This lack of motivation can be caused by various factors, including students' lack of understanding of the movements being taught, limited motor skills, and lack of variety in learning methods. Several studies have shown that students are more likely to be motivated when they feel they have control over their learning and when they feel competent in the activity they are doing (Aldagameh, 2023; Rojo-Ramos et al., 2022). Therefore, there is a need for teaching methods that not only provide clear instructions but are also able to capture students' attention and make them feel comfortable in participating.

One potential solution to address this issue is to integrate animated videos into physical education learning. Animated videos have the advantage of presenting the material in a more interactive and fun way, allowing students to see and understand the movements before they practice them themselves. Previous studies have shown that the use of interactive multimedia in physical education can increase student engagement as well as help them develop motor skills more effectively (Pratama et al., 2022; Tuwoso et al., 2021). In addition, gamification elements in animated videos can also increase students' enthusiasm for learning, create a more enjoyable learning environment and support their holistic development (Jadmiko, 2024). Existing research on the use of technology in physical education has demonstrated a range of benefits, but there is still a gap in studies that specifically explore the impact of using animated videos on the motivation and movement skills of lower primary students. Most previous research has focused on the use of educational games or augmented reality in physical learning (Sirghi, 2022; Sotos-Martínez, 2023). Although these approaches have been proven effective, studies specialising in the effectiveness of animated videos in improving motivation and basic motor skills are limited. Therefore, this study aims to fill this gap by examining how animated videos can improve the motivation and movement skills of lower primary students through more engaging and effective physical education learning.

This study proposes the hypothesis that the use of animated videos in physical education learning can improve the motivation and basic motor skills of lower grade elementary students. It is expected that animated videos can help students understand movements more clearly and pleasantly, which will contribute to the improvement of their basic motor skills, such as coordination, balance and agility. In addition, the use of animated videos is expected to make physical lessons more interesting and motivate students to participate more actively in every physical activity taught. This study aimed to evaluate the effectiveness of animated videos in improving motivation and basic motor skills of lower primary students. By adopting both quantitative and qualitative approaches, the study will observe students' participation levels, changes in their motivation, as well as improvements in motor skills gained after the use of animated videos in physical education learning. The scope of the study covers students in grades



1 to 3 in both urban and rural environments to obtain a more comprehensive picture of the impact of using animated videos in physical education. By exploring the effectiveness of animated videos as a learning medium in physical education, this study is expected to contribute significantly to innovations in teaching methods in primary schools. The results of this study are expected to serve as a reference for educators and policy makers in designing a more engaging and effective physical education curriculum. Thus, the implementation of animated videos in physical education learning can not only increase students' motivation but also help them develop better motor skills, which will ultimately have a positive impact on their overall physical and cognitive development.

Method

The research method used in this study is a True Experimental design, which aims to test the effectiveness of using video media in improving students' motor skills and motivation in learning basic movements. This design was chosen because it allows the researcher to control variables that can affect the results of the study, as well as ensuring that there is a control group that does not receive treatment. The sample used in this study was 200 students using the total sampling technique, then the sample was divided into two groups, namely the experimental group that received treatment (video media of basic motion combination material) and the control group (using a conventional approach). Each group consists of 100 students.

The data collection technique used consists of two types, namely motor tests and motivation questionnaires. To measure learners' motor skills, the Test of Gross Motor Development-2 (TGMD-2) was used, which includes 12 basic skills such as running, jumping, and catching the ball. Meanwhile, to measure learners' motivation, a questionnaire consisting of 12 question items was used. The data analysis technique used was the N-Gain test to see the improvement of motor skills and motivation after the treatment. This test is useful for comparing the difference between pre-test (before treatment) and post-test (after treatment) scores in both groups. By using the N-Gain test, researchers can assess whether there is a significant increase in motor skills and motivation of students after being given video media treatment of basic motion combination material.

Results

The data in table 1 are data collection activities carried out by filling out the research instruments that have been provided through trials of 3 elementary schools in Gerunggang District, namely SD Negeri 3 Pangkalpinang, SD Negeri 40 Pangkalpinang, and SD Negeri 35 Pangkalpinang. The subjects used were 200 students who were divided into 2 groups, namely the experimental group and the control group which was divided into 100 experimental class students and 100 control class students as described.

Table 1. Statistical Test for Motor Learning Effectiveness and Motivation

Test	Class	Statistic	df	Sig.
Kolmogorov-Smirnov Test	Motorik Control Effectiveness	119	100.0	1
Kolmogorov-Smirnov Test	Motorik Experimental Effectiveness	127	100.0	0.0
Shapiro-Wilk Test	Motorik Control Effectiveness	0.96	100.0	4
Shapiro-Wilk Test	Motorik Experimental Effectiveness	977	100.0	71
Levene's Test	Motorik	21.54	1.0	0.0
Levene's Test	Motorik		198.0	
Mann-Whitney U Test	Motorik	15.5		0.0
Wilcoxon Signed Ranks Test	Motorik	5065.5		
Z-Statistic	Motorik	-12.198		
Asymptotic Sig. (2-tailed)	Motorik			0.0
Kolmogorov-Smirnov Test	Motorik Control Effectiveness	211	100.0	0.0
Kolmogorov-Smirnov Test	Motorik Experimental Effectiveness	176	102.0	0.0
Shapiro-Wilk Test	Motorik Control Effectiveness	558	100.0	0.0
Shapiro-Wilk Test	Motorik Experimental Effectiveness	0.92	102.0	0.0
Levene's Test	Motivation	126	1.0	723
Levene's Test	Motivation		200.0	
Mann-Whitney U Test	Motivation	904.5		0.0
Wilcoxon Signed Ranks Test	Motivation	5954.5		
Z-Statistic	Motivation	-10.14		
Asymptotic Sig. (2-tailed)	Motivation			0.0

Based on the normality test results presented in Table 1, the basic movement ability and motivation data showed significant results. In the Kolmogorov-Smirnov test, both groups on the basic movement ability and motivation variables had significance values smaller than 0.05 (0.001 for the motor control group and 0.000 for the motor experimental group on basic movement ability, and 0.000 for both groups on motivation), indicating that the data were not normally distributed. The results of the Shapiro-Wilk test also supported this finding, with significance values smaller than 0.05, namely 0.004 and 0.071 for basic movement skills, and 0.000 for motivation, which confirmed that the data on both variables were not normally distributed. Related to the test of homogeneity of variance (Table 12 and Table 15), the results of Levene's Test showed a significance value smaller than 0.05 (0.000 in basic movement skills), which means that the data variance is not homogeneous, except for motivation which has a significance value greater than 0.05 (0.723), which indicates homogeneous data. In testing the effectiveness of animated video media on basic movement skills and motivation (Table 13 and Table 16), the results of Mann-Whitney U, Wilcoxon W, and Z show a very small significance value (0.000), which means there is a significant difference between the experimental and control groups, both in basic movement skills and motivation. Overall, the data showed that the animated video media on basic movement combinations had a significant effect on participants' basic movement skills and motivation.

Discussion

Research on the use of animated videos to improve motivation and motor skills in primary school students has shown significant results, both in terms of improving physical skills and increasing active participation in physical education activities. Animated videos, as a technology-based learning medium, have proven effective in stimulating students' interest and motivation to participate in physical activities that are essential for their physical and cognitive development. Several previous studies have revealed that the use of animated videos in physical education can enhance students' understanding of basic movements and motor techniques in a more enjoyable and comprehensible manner (Fajriati & Putra, 2023; Sudirman et al., 2024). Animated videos provide visual representations that make it easier for students to understand movements, thus helping them develop coordination, balance, and agility skills, which are the foundation of motor abilities. This study found that the use of animated video media in learning basic movement skills produced significant results in increasing students' motivation and motor skills. The results of the normality test conducted showed that both the experimental group, which received animated video media treatment, and the control group, which did not, showed significant differences in both variables (basic movement skills and motivation) with very small significance values ($p < 0.05$) in the Mann-Whitney U, Wilcoxon W, and Z tests (Anggoro et al., 2023; Cookson et al., 2020). The use of animated videos allows students to see a clear demonstration of the movements, supporting their understanding before practicing them directly. This is especially important for younger students who still struggle to understand the abstract concepts of physical movement (Sari et al., 2024; Widiasih et al., 2022). Thus, animated videos not only improve students' motor skills but also increase their level of participation in physical education lessons.

One of the approaches used in this study is the flipped classroom model, which has shown positive results in video animation-based learning. This model allows students to learn the material through animated videos first, then apply what they have learned in practice sessions. Research by Hur et al. (2019) revealed that this approach helps students be better prepared and more confident in performing physical activities after understanding the theory taught through videos. This learning model also gives students the opportunity to learn at their own pace, which supports diverse learning styles and helps them feel more engaged in the learning process (Anggoro et al., 2023). Furthermore, the results of this study also indicate that animated videos can be an effective tool to overcome the problem of students' lack of motivation in physical education lessons. According to Manzano-Sánchez, (2023), fulfilling basic psychological needs such as autonomy and competence in physical activities can increase students' motivation. In this context, animated videos offer students the opportunity to feel more involved and in control of their own learning process. Additionally, interactive and enjoyable animated videos can transform a boring physical lesson into an engaging experience and inspire students to participate more actively (Li, 2023; Li & Siriphan, 2023; Setyawan et al., 2022).



Based on these findings, several recommendations for future research are proposed. First, it is important to develop a wide variety of animated videos that not only teach physical movements but also incorporate elements of gamification and interactivity that can further stimulate students' motivation. Moreover, further research is needed to explore the long-term effects of using animated videos on students' motor development and motivation, as well as to compare their effectiveness with other learning methods, such as the use of augmented reality applications or technology-based educational games (Pratama et al., 2022; Tuwoso et al., 2021; Yoluut et al., 2024). Further research on the effects of animated videos in the context of physical education could also involve various aspects, such as how animated videos can be applied to students with special needs or in broader learning contexts, such as physical education in secondary schools (Dobrescu, 2019).

Overall, the use of animated videos in physical education is proving to be an innovation with great potential to enhance motivation and motor skills in primary school students. With the development of technology and interactive learning methods, the application of animated videos in the physical education curriculum is expected to have a sustainable positive impact on students' physical and cognitive development in the future. In the future, the integration of this technology will become an integral part of effective physical education, considering the need for a more engaging and holistic approach in supporting student development. However, in some parts of this discussion, there are speculative interpretations. For instance, it is assumed that animated videos increase students' motivation due to their interactivity, but there is no data supporting this causal relationship. Furthermore, there is no discussion of potential biases in the study, such as the bias from participants knowing they were part of the experimental group, which could have influenced their motivation. Therefore, it is recommended to avoid speculative statements that are not supported by data, include an analysis of potential biases that may have affected the results, and expand the limitations section to consider contextual factors such as unequal access to technology.

Conclusions

The use of animated videos in physical education learning in primary schools has been shown to have a significant impact in improving students' motivation and motor skills. This study revealed that animated video media can make learning more interesting and enjoyable for students, especially for those who are less interested in physical activities. Animated videos that present basic movements clearly help students understand the technique and coordination needed in physical activities. This is particularly important for students in the lower grades who may struggle to understand physical movements in the abstract. By using animated videos, students can see clearer demonstrations of movements before practising them, which indirectly improves their motor skills. In addition, animated videos also increase students' motivation to participate in physical education lessons. Interesting and interactive animated videos are able to capture students' attention and encourage them to be more actively involved in physical activity. This approach provides an opportunity for students to learn at their own pace, which can increase their confidence and comfort in doing physical activities. The results showed that the group that used the animated videos experienced a significant increase in motor skills and motivation compared to the control group that did not receive this treatment. Thus, the use of animated videos proved to be effective in addressing the problem of students' lack of motivation and participation in physical education lessons. Overall, this study provides strong evidence of the importance of applying technology in physical education, specifically the use of animated videos to improve students' motor skills and motivation. Therefore, in the future, the use of animated videos should be further expanded and developed to cover various other aspects of physical education learning, and can be applied at higher education levels to enhance students' learning experience.

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