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THE INFLUENCE OF SOCIAL EMOTIONAL IMPLEMENTATION ON PHYSICAL EDUCATION LEARNING OUTCOMES: DIGITAL TECHNOLOGY-BASED LEARNING MODEL

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ABSTRACT

This study looks to find out how using social-emotional tools affects learning in physical education, sports, and health for students at elementary school, using a digital technology-based learning model. This study uses a quantitative approach with an experimental method. The research design used is a pre-experimental design with a one-group pretest-posttest design model. The research sample was 23 fifth-grade students at Public Elementary School Bawakaraeng I, selected using a purposive sampling technique. The research instruments consisted of a physical education outcome test, an observation sheet for the application of social-emotional learning, and a student response questionnaire. The data analysis technique used descriptive and inferential statistics in the form of a paired sample t-test with a significance level of 5%, which was preceded by an analysis prerequisite test. The results indicated that there was a significant effect of the application of social-emotional learning on physical education learning outcomes using a digital technology-based learning model. Our finding is evidenced by the t-observation value of 14.945, which is greater than the t-table value of 1.717 (14.945 > 1.717) with a significance value of 0.000 ($p < 0.05$). Comparison of the average pretest and posttest values showed an increase from 86.39 to 92.96, with a difference of 6.565 points. The application of social-emotional learning with a digital technology-based learning model has proven effective in improving students' physical education learning outcomes.

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1. INTRODUCTION

Education has a fundamental meaning as an effort to shape individual personalities in accordance with the values that apply in society and culture (Gamage et al., 2021). In a pedagogical context, education is closely related to character formation and the development of approaches and methodologies in the learning process that utilize various learning resources (Zhao et al., 2024). In the development of education, the social-emotional aspects of students are very important because this aspect affects

interactions in the school environment and society (Wang et al., 2022). This includes behavior, self-control, adjustment, and understanding of applicable norms (Quratul 'Aini et al., 2024; Waruwu, 2024; Tsary & Widarti, 2024; Rasyid et al., 2024; Utami et al., 2014).

Children aged 6–12 who spend most of their time at school, need support not only from parents but also from educational institutions. We can teach social-emotional development at this age to equip them to navigate the learning process and attain academic success. Erik Erikson's theory of the developmental stage of industry versus inferiority explains that at this age range, children begin to develop the ability to work hard, complete tasks, and achieve goals, especially in academic and social contexts. These skills are important for building self-confidence and competence. Conversely, failure to achieve goals can lead to feelings of inferiority, which negatively impact children's self-confidence and mental health (Arifin & Sabri, 2022; Juliani et al., 2022; Salindri & Salamah, 2022).

Social-emotional is the ability of individuals to recognize, understand, and manage their emotions and be able to interact with others, which includes self-awareness, managing emotions, empathy, forming positive relationships, and making advantageous decisions (Age & Hamzanwadi, 2020). Social emotional learning is defined as the process experienced by children and adults in developing students' skills, attitudes, and values to achieve social and emotional competence. The importance of PSEl, or social-emotional learning, in the context of education can help students recognize and understand the various types of emotions that learners feel (Tsary & Widarti, 2024).

The characteristics of children at this stage show a desire to master new skills and achieve success, both in academic and social aspects. Support from the environment is needed to build self-confidence, and inadequate support can trigger feelings of inferiority. Therefore, the role of teachers is crucial in expanding children's social space and supporting their development. Teachers are required to have professional competencies that are in accordance with the needs of society and the state, including the ability to educate, guide, and evaluate students (Ingram et al., 2021).

Physical Education, Sports, and Health plays an important role in the education curriculum in Indonesia, not only in improving physical fitness but also in paying attention to the social-emotional aspects of students. Research shows that social-emotional learning contributes significantly to all academic areas and requires collaboration between various parties and adjustments to school culture (Thierry et al., 2022). However, there are still challenges in implementing this approach, especially among physical education teachers who often focus more on intellectual intelligence (IQ) and motor skills, while emotional intelligence (EQ) is also crucial to pay attention to.

This study offers a novelty in the approach to learning physical education, sports, and health by integrating social-emotional applications through a digital technology-based learning model. By utilizing digital tools and platforms, this study aims to create a more interactive and collaborative learning environment, which allows students to more easily recognize and manage their emotions. This approach not only focuses on

developing physical skills but also on improving emotional intelligence so that students can build better social relationships and improve learning outcomes.

One of the main differences between this study and previous studies is the focus on the combination of social-emotional and digital technology applications in physical education learning. Many previous studies have only examined one aspect, such as the development of emotional intelligence without considering the use of technology, or vice versa, the use of technology without considering the social-emotional context. This study combines both elements to create a more holistic approach to education so that it can provide innovative solutions to the challenges faced in the classroom.

Today's digital era makes the application of technology in learning highly relevant, supporting social-emotional learning. Technology can facilitate interactive and collaborative learning and provide real-time feedback to students (Bjelobaba et al., 2023; Garlinska et al., 2023). Thus, this study seeks to assess the impact of the application of social-emotional education and digital-based learning models in physical education subjects for 5th grade elementary school students. Problems that often arise, such as peer grouping, bullying, and difficulties in understanding and managing emotions, indicate the need for a more effective approach.

Through this study, it is hoped that innovative and effective learning strategies can be found to improve the quality of character education in schools, thereby creating a safe, interesting, and comfortable learning environment.

2. METHOD

This study uses a quantitative approach with an experimental method. This method was chosen because the study aims to test the effect of social-emotional application on physical education learning outcomes using a digital technology-based learning model. According to Sugiyono (2019), experimental research is a study that tries to determine the effect of certain variables on other variables in strictly controlled conditions. We conducted this research at public elementary school Bawakaraeng 1 Makassar. The research period spanned one semester, specifically the even semester of the 2024/2025 academic year, from February to April 2025. The selection of the research location was based on considerations of the availability of adequate digital technology facilities to support the implementation of the research. The research design used was a pre-experimental design with a one-group pretest-posttest design model. The population in this study were all public elementary school Bawakaraeng students, totaling 180 students divided into 6 classes. The sampling technique used purposive sampling, which is a sampling technique with certain considerations (Creswell & Creswell, 2020). The sample selection criteria were classes that had homogeneous characteristics in terms of initial physical education abilities and the availability of access to digital technology. These criteria led to the selection of class V as the research sample, comprising a total of 23 students.

The research instrument consisted of a cognitive test in the form of multiple-choice questions and descriptions to measure students' conceptual understanding of the physical education material. We used student response questionnaires to assess the

implementation of digital technology-based learning models in physical education. We used observation sheets to track the integration of social-emotional learning into physical education learning.

The instrument's validity was tested using content validity by physical education experts and educational evaluation experts. The reliability of the learning outcome test instrument was tested using the Cronbach Alpha formula with a reliability coefficient of 0.85, indicating a high level of reliability (Azwar, 2021).

Data collection was carried out systematically by involving a research team that had received training on data collection procedures to ensure data consistency and accuracy (Johnson & Christensen, 2019). Data analysis in this study used descriptive and inferential statistics. Descriptive statistics are used to describe data characteristics through average values, standard deviations, minimum values, and maximum values. We use inferential statistics to test the research hypothesis.

After the prerequisite test is met, hypothesis testing is carried out using a paired sample t-test to determine the difference in student learning outcomes before and after being given treatment. The testing criteria state that the null hypothesis (Ho) is rejected if the t-count value exceeds the t-table value at a significance level of 5% ($\alpha = 0.05$). Data analysis was carried out with the help of SPSS software version 26.0 for Windows (Pallant, 2020).

3. RESULTS AND DISCUSSION

Results

Descriptive Analysis

The purpose of descriptive statistical analysis is to obtain a comprehensive understanding of the research data. The results of descriptive analysis data include the mean, minimum, standard deviation, total sample, and maximum data on the application of social-emotional learning to physical education learning outcomes using a digital technology-based learning model.

Table 1. Descriptive Analysis

Variable	N	Sum	Mean	Stdv	Variance	Range	Min	Max
Experimental Class Pretest	23	1987	86,39	1,924	3,704	8	82	90
Experimental Class Posttest	23	2138	92,96	2,056	4,225	7	90	97

Table 1 above describes the descriptive analysis results as follows: The descriptive data from the pretest (initial test) of the application of social-emotional learning, using a digital technology-based learning model, on learning outcomes involved a sample of 23 people and yielded a total value of 1987. The average value obtained was 86.39 with a standard deviation of 1.924 and a variance value of 3.704. We obtained a range value

of 8, with a minimum value of 82 and a maximum value of 90. The final test, called the descriptive data posttest, looked at how a digital technology-based learning model affected social-emotional learning results, using a group of 23 people, with a total score of 2138. The average value obtained was 92.96 with a standard deviation of 2.056 and a variance value of 4.225. We obtained a range of 7, which ranged from a minimum of 90 to a maximum of 97.

Table 2. Normality Test

Variable	Kolmogorov-Smirnov[a]		
	Statistic	**df**	**Sig.**
Pretest of Physical Education Learning Outcomes of Experimental Class	0,148	16	0,200
Pretest of Physical Education Learning Outcomes of Experimental Class	0,157	16	0,145

All variables have a significant value > 0.05, which means all data are normally distributed. This suggests that the data satisfies the normality assumption, allowing for further analysis.

T-Test

Hypothesis testing in the study used the t-test. The t-test was used to test the effect of treatment on the physical education learning outcome group. Summary of the results of the paired t-test analysis of the social-emotional application result group on learning outcomes using a digital technology-based learning model. Hypothesis testing of the effect of social-emotional application on physical education learning outcomes using a digital technology-based model using a paired t-test, namely the pretest and posttest of physical education learning outcomes. The explanation can be seen in Table 3 of the following summary:

Table 3. T-Test Results

Hypothesis	Mean	$t_{observation}$	Table	P	α	Description
Pretest	86,39	14,945	1,717	0,000	0,05	Significant
Posttest	92,96					

The t-test results presented in Table 3 indicate that there is a significant influence of the social-emotional application group on physical education learning outcomes when using a digital technology-based learning model; the observation value of 14.945 is greater than the t-table value of 1.717 (14.945 > 1.717), and the significant value of 0.000 is smaller than α = 0.05. Therefore, the rejection of Ho and acceptance of H1 indicate a difference between the pretest (initial test) and posttest (final test).

Thus, it can be concluded that the application of social emotions has a significant influence on physical education learning outcomes using a digital technology-based

learning model. This can be proven by seeing the average pretest value is lower than the average posttest value, or μA1 86.39 < μA2 92.96, with a difference of 6.565. Thus, it can be concluded that the application of social emotions has a significant influence on physical education learning outcomes using a digital technology-based learning model.

Discussion

The results of the data analysis and hypothesis testing that have been previously stated indicate that the proposed hypothesis is accepted and show a significant influence. The calculation results obtained an observation value greater than the t-table value at a significance level of 95%. This proves that the proposed hypothesis is accepted at a significance level of 95%. The prediction that can be put forward is that the application of a social-emotional learning model using technology can improve learning outcomes.

The results of the study indicated that the social-emotional application group significantly influenced physical education learning outcomes when using a digital technology-based learning model. This finding is based on the results of the t-test, which showed a t-observation value of 14.945 greater than the t-table value of 1.717 (14.945> 1.717) with a significance value of 0.000 ($p < 0.05$). The comparison of the average pretest and posttest values (86.39 < 92.96) with a difference of 6.565 further strengthens the conclusion that the intervention given has a positive impact on improving student learning outcomes.

This significant increase in physical education learning outcomes is in line with the findings of Rachman et al. (2021), which indicated that the integration of social-emotional aspects in physical education learning can improve the quality of learning and academic achievement of students. The study revealed that learning that pays attention to social-emotional aspects helps students develop interpersonal skills that support the learning process and collaboration in physical activities (Rachman et al., 2021).

This phenomenon of increased learning outcomes can be understood through the perspective of social emotional learning (SEL) proposed by Gunawan and Armansyah (2022). According to their research, social-emotional learning helps students develop self-awareness, regulate emotions, and build positive relationships with others, which ultimately creates a more conducive learning environment. In the context of physical education, social-emotional skills such as teamwork, effective communication, and emotional regulation are important components that support successful learning (Gunawan & Armansyah, 2022).

The use of digital technology in the application of social-emotional learning provides a new dimension in the physical education learning process. This is supported by Winarno's research (2021), which explains that the integration of technology in physical education learning allows students to access various learning resources, visualize movements, and acquire faster and more precise feedback. The use of digital technology also helps teachers design learning activities that are more personal and responsive to the individual needs of students.

The average increase in learning outcomes of 6.565 points shows the effectiveness of the learning model applied. This conclusion is in line with research by Mustafa and

Dwiyogo (2020), which found that the use of digital technology in physical education learning can increase students' learning motivation and conceptual understanding. They noted a significant increase in learning outcomes when digital technology was integrated into physical education learning, especially in the cognitive and psychomotor aspects.

The research findings also emphasize the importance of social-emotional development in the context of modern physical education. As stated by Widiyatmoko and Hudah (2023), physical education not only focuses on the development of motor skills but also plays an important role in the formation of character and social-emotional skills among students. Their research indicates that a learning approach that pays attention to social-emotional aspects can increase students' self-confidence, conflict management skills, and sportsmanship. In the context of digital technology-based learning, the results of this study strengthen the argument of Setiyawan et al. (2022), who stated that technology can be a catalyst in the transformation of physical education learning. Their research revealed that the use of digital technology, such as mobile applications, motion analysis videos, and online learning platforms, can enrich students' learning experiences and facilitate the application of social-emotional learning principles in the context of physical education.

In addition, the findings of this study can also be associated with the concept of "blended learning" in physical education discussed by Pratama (2021). Blended learning combines face-to-face instruction with digital technology, allowing students to access learning materials and practice independently outside of formal class hours. The study indicates that the blended learning approach can increase students' active involvement in physical education learning and strengthen the development of their social-emotional skills.

The comparison of pretest and posttest scores, which showed a significant increase, is also in line with the results of research by Nugroho et al. (2023), who found that the implementation of digital technology-based learning in physical education can improve students' analytical and evaluative abilities. Students not only understand the concept of movement but are also able to analyze and evaluate their performance, which ultimately contributes to improving learning outcomes.

An educational neurology perspective can also explain the improvement in physical education learning outcomes through the application of social-emotional learning based on digital technology. According to Mahendra's research (2022), physical activity combined with cognitive and social-emotional stimuli can optimize brain function and increase learning capacity. The study noted that a learning approach that pays attention to social-emotional aspects can increase the production of neurotransmitters that play a role in the learning and memory process.

The findings of this study also strengthen the argument that social-emotional development is an integral component of contemporary physical education. As expressed by Supriatna and Wahyupurnomo (2021), modern physical education not only focuses on the development of motor skills but also plays a role in the formation of character, emotional intelligence, and social skills among students. They noted that a

learning approach that pays attention to social-emotional aspects can create a more meaningful and relevant learning experience for students.

The effectiveness of digital technology-based learning models in improving physical education learning outcomes is also supported by Dwiyogo's research (2021), which emphasizes the importance of adapting to technological developments in physical education. The study revealed that the use of digital technology can facilitate personalization of learning, allowing students to learn according to their pace and learning style and acquire more specific and constructive feedback (Dwiyogo, 2021).

Furthermore, the results of this study support Maksum's (2022) view on the transformation of physical education in the digital era. According to the study, integrating digital technology into physical education increases learning effectiveness and efficiency and prepares students to face challenges in the digital era. A learning approach that combines social-emotional development with the use of digital technology helps students develop digital literacy while maintaining social and emotional aspects in learning. The findings of this study can also be linked to the concept of "physical literacy" discussed by Widodo and Kusnanik (2022). Physical literacy refers to the motivation, self-confidence, physical competence, knowledge, and understanding needed to appreciate and be responsible for engaging in lifelong physical activity. The study revealed that a learning approach that pays attention to social-emotional aspects and utilizes digital technology can strengthen the development of students' physical literacy, which ultimately contributes to improving learning outcomes (Widodo & Kusnanik, 2022).

The positive impact of implementing social-emotional learning based on digital technology is also reflected in the motivational aspects of students. In line with research by Ardha et al. (2021), a learning approach that integrates social-emotional aspects and digital technology can increase students' intrinsic motivation in physical education learning. This increase in motivation ultimately contributes to students' active involvement in learning and improved learning outcomes.

In addition, the results of this study strengthen the view that physical education has a strategic role in developing 21st-century skills. As stated by Juniarta and Winarno (2023), modern physical education needs to emphasize the development of skills such as communication, collaboration, critical thinking, and creativity. A learning approach that pays attention to social-emotional aspects and utilizes digital technology allows students to develop these skills in the context of physical activity.

The significant increase in physical education learning outcomes in this study also supports the argument of Pambudi and Winarno (2022) about the importance of pedagogical innovation in physical education. According to the study, innovative learning approaches, such as the integration of social-emotional development and the use of digital technology, can enrich students' learning experiences and facilitate the achievement of comprehensive physical education learning objectives. They noted that pedagogical innovation in physical education not only improves the effectiveness of learning but also prepares students to face future challenges. The results of this study confirm that the application of social-emotional learning based on digital technology is

an effective approach in improving physical education learning outcomes. These findings support the argument that modern physical education needs to adopt a holistic learning approach, which pays attention to the physical, cognitive, and social-emotional aspects of students and utilizes the potential of digital technology to enrich the learning experience. As emphasized by Rahayu et al. (2021), quality physical education requires a learning approach that is relevant to the times and responsive to the needs of students.

4. CONCLUSION

The application of social-emotional learning by utilizing digital technology has had a significant impact on physical education learning outcomes in class V at public elementary school Bawakaraeng 1 Makassar. The data analysis technique used descriptive and inferential statistics in the form of a paired sample t-test with a significance level of 5%, which was preceded by an analysis prerequisite test. The results showed that there was a significant effect on the application of social-emotional learning on physical education learning outcomes using a digital technology-based learning model. This is evidenced by the t-observation value of 14.945, which is greater than the t-table value of 1.717 (14.945 > 1.717) with a significance value of 0.000 ($p < 0.05$). Comparison of the average pretest and posttest values showed an increase from 86.39 to 92.96, with a difference of 6,565 points. The application of social-emotional learning with a digital technology-based learning model has proven effective in improving students' physical education learning outcomes.

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