The combined effect of learning model and teaching style spectrum on student satisfaction in Physical Education learning

El efecto combinado del modelo de aprendizaje y el espectro de estilos de enseñanza en la satisfacción de los estudiantes en el aprendizaje de la Educación Física

Authors

Cahyo Wibowo [1]
Arizky Ramadhan [2]
Yahya Eko Nopiyanto [3]
Kukuh Pambuka Putra [4]
Yusuf Hartanto [5]
Sanfia Tesabela Messakh [6]
Dennys Christovel Dese [7]
Priska Lydia Sulistyawati Pulungan[8]

[1, 4, 5, 6, 7, 8] Satya Wacana Christian University (Indonesia)
[2] Universitas Sriwijaya (Indonesia)
[3] Universitas Bengkulu (Indonesia)

Corresponding author:
Arizky Ramadhan
arizkyramadhan@fkip.unsri.ac.id

Received: 15-01-25
Accepted: 09-09-25

How to cite in APA

Wibowo, C., Ramadhan, A., Nopiyanto, Y. E., Putra, K. P., Hartanto, Y., Messakh, S. T., Dese, D. C., & Pulungan, P. L. S. (2025). The combined effect of learning model and teaching style spectrum on student satisfaction in Physical Education learning. *Retos, 73*, 192-200. https://doi.org/10.47197/retos.v73.112948

Abstract

Introduction: Student satisfaction in physical education is achieved when teachers apply appropriate teaching approaches that meet student needs.
Objective: This study explored student satisfaction through two innovative models, teaching games for understanding and project-based learning, with productive and reproductive teaching styles.
Methodology: A quasi-experimental design with five groups was employed, involving 81 elementary school students aged 12–13 years from four schools in Salatiga. Data were collected using a pretest and a posttest with a sports satisfaction instrument, and analyzed using ANOVA.
Results: The results showed that teaching games for understanding with a reproductive style ($p = 0.006$) and productive style ($p = 0.041$) significantly increased student satisfaction. Similarly, project-based learning with a reproductive style ($p = 0.031$) and productive style ($p = 0.002$) also had a positive effect, while conventional learning methods did not show a significant increase ($p = 0.12$). Among the tested approaches, project-based learning with a reproductive style had the most substantial impact on student satisfaction, followed by teaching games for understanding with a productive style.
Discussion: These findings indicate that combining teaching games for understanding and project-based learning with different spectrum teaching styles can foster student autonomy, creativity, and social interaction. Such approaches enhance intrinsic motivation, self-confidence, and engagement in learning, offering more meaningful experiences than conventional teacher-centered methods.
Conclusions: student-centered pedagogical models in physical education are more effective in promoting satisfaction, and project-based learning with a reproductive style emerged as the most influential approach.

Keywords

Learning model; Physical Education; satisfaction; teaching style.

Resumen

Introducción: La satisfacción del alumnado en educación física se logra cuando el profesorado aplica enfoques didácticos adecuados que satisfacen sus necesidades.
Objetivo: Este estudio exploró la satisfacción de los estudiantes a través de dos modelos innovadores, juegos de enseñanza para la comprensión y aprendizaje basado en proyectos, con estilos de enseñanza productivos y reproductivos.
Metodología: Se empleó un diseño cuasiexperimental con cinco grupos, en el que participaron 81 alumnos de primaria de 12 a 13 años de cuatro escuelas de Salatiga. Los datos se recopilaron mediante un pretest y un postest con un instrumento de satisfacción deportiva, y se analizaron mediante ANOVA.
Resultados: Los resultados mostraron que la enseñanza de juegos para la comprensión con un estilo reproductivo ($p = 0{,}006$) y un estilo productivo ($p = 0{,}041$) aumentó significativamente la satisfacción del alumnado. De igual forma, el aprendizaje basado en proyectos con un estilo reproductivo ($p = 0{,}031$) y un estilo productivo ($p = 0{,}002$) también tuvo un efecto positivo, mientras que los métodos de aprendizaje convencionales no mostraron un aumento significativo ($p = 0{,}12$). Entre los enfoques evaluados, el aprendizaje basado en proyectos con un estilo reproductivo tuvo el mayor impacto en la satisfacción del alumnado, seguido de la enseñanza de juegos para la comprensión con un estilo productivo.
Discusión: Estos hallazgos indican que la combinación de juegos didácticos para la comprensión y el aprendizaje basado en proyectos con diferentes estilos de enseñanza puede fomentar la autonomía, la creatividad y la interacción social del alumnado. Estos enfoques mejoran la motivación intrínseca, la autoconfianza y la implicación en el aprendizaje, ofreciendo experiencias más significativas que los métodos convencionales centrados en el profesorado.
Conclusiones: Los modelos pedagógicos centrados en el alumnado en educación física son más eficaces para promover la satisfacción, y el aprendizaje basado en proyectos con un estilo reproductivo resultó ser el enfoque más influyente.

Palabras clave

Educación Física; estilo de enseñanza; modelo de aprendizaje; satisfacción.

Introduction

Student satisfaction is identical to the level of happiness felt when following all learning processes (Román et al., 2019). Student satisfaction is an important aspect that needs to be studied in physical education learning because it will have an impact on the level of motivation, academic results, or psychological well-being of students (Baena-Extremera & Granero-Gallegos, 2015). Student satisfaction is influenced by various factors, including the teacher's ability to present interesting material for students, use a fun learning approach, and adjust learning materials to the level of student ability and student learning style (Wilson & Cotgrave, 2016).

Various studies have shown that the teaching style and learning model applied by teachers in physical education learning contribute to student activity (Hardiansyah et al., 2025; P. L. Invernizzi et al., 2019). A student-centered teaching style has a positive impact on learning motivation, understanding of material, and social skills (Adipat et al., 2021). Other findings also reveal that game-based learning and cooperative approaches help students to be more involved in each learning (Fonseca et al., 2023). From these findings, adaptable learning according to student needs is an important foundation for holistic student development.

A fairly familiar learning model in physical education teaching is teaching games for understanding (TGfU). TGfU refers to the development of student skills through a modified game context with the aim of increasing student involvement and making it easier for students to understand learning materials (Ritonga et al., 2024). In addition, teachers also choose project-based learning (PjBL) models to present learning. PjBL provides learning experiences for students to complete real projects that are relevant to everyday life collaboratively (Coyne et al., 2016).

TGfU and PjBL are student-centered learning models and have a positive impact on students in following the learning process (Elumalai et al., 2022). However, an in-depth study of the combination of TGfU, PjBL, and the spectrum of teaching styles in physical education learning in elementary schools has not been widely explored. This combination provides an opportunity to provide comprehensive insight into increasing student satisfaction in the learning process. This study provides a new and innovative paradigm regarding how the interaction between these two variables, learning models and teaching styles, shapes the learning experiences of elementary school students. This study offers deeper insight into optimizing physical education learning by identifying certain patterns in the combination of learning models and teaching styles.

Although several studies have shed light on innovative teaching approaches in physical education, few studies have comprehensively examined the combined effects of TGfU and PjBL across various teaching styles at the primary school level. Some previous research has focused only on learning models or teaching styles in isolation and ignored the potential interaction between these two key pedagogical elements (Batez et al., 2021; Pill et al., 2024; Septaliza et al., 2024). This fragmented approach limits a deeper understanding of how specific combinations of learning models and teaching styles affect student satisfaction, engagement, and the overall learning experience in physical education. Addressing this gap is critical, as integrating different pedagogical strategies can provide a more effective, engaging, and student-centered learning environment that enhances cognitive and motor skills development. Therefore, further investigation into the interaction between TGfU, PBL, and different teaching styles is needed to offer a more comprehensive framework for optimizing physical education teaching in primary schools.

Based on the description above, the question in this study can be formulated, namely, how does the combination of TGfU, PjBL, and the spectrum of teaching styles affect student satisfaction in physical education learning? This study aims to determine the effect of learning models and the spectrum of teaching styles on student satisfaction in physical education learning in elementary schools. The combination of TGfU, PjBL, and spectrum teaching styles can increase student satisfaction with physical education learning.

Method

This study employs a quasi-experimental approach using a Non-Equivalent Control Group Design. This experimental design forms control groups without randomization and assigns individuals or units to these groups. There are four experimental groups and one control group in this research. The study applies treatments to elementary school students based on two variables. The first variable consists of instructional models: Teaching Games for Understanding (TGfU) and Project-Based Learning (PBL). The second variable is the spectrum of teaching styles, divided into reproductive and productive styles. Reproductive styles include command, practice, reciprocal, self-check, and inclusion processes. Meanwhile, productive styles include guided discovery, problem-solving, individual-based choice, learner-initiated, and self-teaching (P. Invernizzi et al., 2019; Muska Mosston & Sara Ashworth, 2010).

Participants

This study's participants consist of 81 elementary school students from four different schools in the city of Salatiga, representing diverse backgrounds. The population for this research includes elementary school students in Salatiga and its surrounding areas. This study employs a purposive sampling technique, with the criteria focusing on students aged 12–13.

Procedure

The intervention process is conducted over eight weeks, involving field activities and classroom sessions for each class group. Each intervention was delivered twice a week for eight weeks, with each session lasting 3 x 35 minutes. The intervention structure was designed to ensure a progressive and systematic student learning experience. In the first session of each week (35 minutes), students were introduced to the basic concepts of the assigned learning models, TGfU and PjBL, through a combination of theoretical explanations, demonstrations, and discussions guided by the researcher and teacher. The second session of each week (2 x 35 minutes) focused on the practical application of the learning models in a physical education setting. During this session, students actively participate in structured activities, modified games, or project-based tasks that align with the learning model and the prescribed spectrum of teaching styles (reproductive or productive).

Table 1. Study Organization

Pretest	Treatment	Posttest
O1 Satisfaction	T1 Teaching Game for Understanding, Reproductive Styles	O2 Satisfaction
O3 Satisfaction	T2 Teaching Game for Understanding, Productive styles	O4 Satisfaction
O5 Satisfaction	T3 Project Based Learning, Reproductive styles	O6 Satisfaction
O7 Satisfaction	T4 Project Based Learning, Productive styles	O8 Satisfaction
09 Satisfaction	T5 Conventional	O10 Satisfaction

Description:

- O1, O3, O5, O7, O9 : experimental group 1, 2, 3, 4 and control group 5
- T1, T2, T3, T4 : experimental treatment
- T5 : conventional treatment group (control)
- O2, O4, O6, O8, O10 : post-test group

Instrument

The instrument used in this study is the Sport Satisfaction Instrument (Duda & Nicholls, 1992), which has been adapted for physical education classes in schools and has also been applied in previous research to assess students' satisfaction with physical education learning (Morales-Sánchez et al., 2021). This instrument consists of 8 statement items: "I usually have fun in physical education class." The

instrument is scored using a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The instrument demonstrates internal consistency with a Cronbach's alpha reliability coefficient of 0.79. Data collection will be conducted twice during the pretest and posttest phases by administering the SSI questionnaire. Before completing the questionnaire, students will receive detailed instructions on how to fill it out adequately.

Data analysis

This study employs various statistical analysis methods, including descriptive statistical analysis, prerequisite tests, analysis of variance (ANOVA), and hypothesis testing using paired sample t-tests. Descriptive statistical analysis focuses on summarizing and visualizing the collected data, such as calculating the mean and standard deviation, to provide an overview of the data characteristics. Prerequisite tests are conducted as an initial step before the primary analysis to ensure that statistical assumptions, such as data normality and homogeneity, are met. ANOVA compares the means among three or more variable groups to identify significant differences between variables. Meanwhile, hypothesis testing with paired sample t-tests is applied to assess significant changes in data before and after the treatment or intervention (pretest-posttest)

Results

This section presents the main findings of the research conducted, focusing on analyzing the differences in students' satisfaction levels with the various physical education learning models applied. Data obtained through the Sport Satisfaction Instrument (SSI) were systematically analyzed to evaluate the effectiveness of the TGfU and PjBL approaches in increasing students' learning satisfaction. The results of this analysis also consider variations in teachers' teaching styles, both reproductive and productive, which influence students' perceptions of the learning process. The findings are interpreted in the context of physical education theory and supported by previous studies to provide a deeper understanding of the relationship between interactive learning methods and student satisfaction levels.

Table 2. Description Statistics

Variable	N	min	max	mean	Std. Deviation	Skewness	Kurtosis
Satisfaction	81	14	31	24.15	3.630	-.457	0.238

Based on the descriptive analysis of the satisfaction variable on a sample of 81 respondents, the minimum value obtained is 14, while the maximum is 31. The average satisfaction score is at a value of 24.15 with a standard deviation of 3.630, which shows moderate variation among respondents. The skewness value of -0.457 indicates a data distribution that tends to be skewed to the left but is still within the normal distribution range. Meanwhile, the kurtosis value of 0.238 indicates a data distribution relatively close to normal, with no tendency for extreme spikes or data spread.

Table 3. Normality Test

Kolmogorov-Smirnov	Homogeneity
0,181	0,203

Based on the Kolmogorov-Smirnov normality test results, a value of 0.181 was obtained, indicating that the data is usually distributed at an acceptable significance level in this study. In addition, the homogeneity test result of 0.203 indicates that the variance between data groups is homogeneous, which means that the homogeneity assumption is met. These results support the eligibility of the data for further analysis, which requires normality and homogeneity of distribution.

Table 4. Anova Test

	Sum of square	df	Mean Square	F	Sig.
Between groups	151.940	4	37,985	3,200	0,017
Within Groups	902.282	76	11.872		
Total	1054,222	80			

The results of the ANOVA analysis indicate significant differences among the groups tested. The sum of squares between groups is 151.940 with a degree of freedom (df) of 4, resulting in a mean square of 37.985. Meanwhile, the sum of squares within groups is 902.282, with a pdf of 76, yielding a mean square of 11.872. The resulting F-value is 3.200, with a significance (p) value of 0.017, less than 0.05. Therefore, these results suggest significant differences between the groups on the tested variable.

Table 5. Paired Sample Statistic

Variable	Treatment		Mean	Std. Deviation
Satisfaction	Teaching Game for Understanding, Reproductive Styles (T1)	Pretest	23.24	2.562
		Posttest	25.53	4.140
	Teaching Game for Understanding, Productive Styles (T2)	Pretest	20.89	4.256
		Posttest	25.11	1.833
	Project Based Learning, Reproductive styles (T3)	Pretest	23.5	3.167
		Posttest	24.33	3.010
	Project Based Learning, Productive styles (T4)	Pretest	23.67	3.710
		Posttest	24.67	2.870
	Conventional (T5)	Pretest	24.05	3.865
		Posttest	21.79	4.131

The paired sample statistics analysis results show changes in satisfaction levels across various treatments measured in the pretest and posttest. In the Teaching Game for Understanding method with a reproductive style (T1), the mean score increased from 23.24 (standard deviation = 2.562) in the pretest to 25.53 (standard deviation = 4.140) in the posttest. In the same method with a productive style (T2), the mean score also increased from 20.89 (standard deviation = 4.256) in the pretest to 25.11 (standard deviation = 1.833) in the posttest. For the Project-Based Learning method with a reproductive style (T3), the mean score rose from 23.5 (standard deviation = 3.167) in the pretest to 24.33 (standard deviation = 3.010) in the posttest. Meanwhile, with a productive style (T4), the mean score increased from 23.67 (standard deviation = 3.710) in the pretest to 24.67 (standard deviation = 2.870) in the posttest. In contrast, the conventional method (T5) showed a decrease in the mean score from 24.05 (standard deviation = 3.865) in the pretest to 21.79 (standard deviation = 4.131) in the posttest. These results indicate a significant improvement in various innovative methods compared to the conventional method, which decreased satisfaction in the posttest.

Table 6. Paired Sample t-test

			95% confidence interval of difference				
Satisfaction	Mean	Std. Deviation	lower	Upper	t	df	Sig. (2 tailed
T1 pretest-posttest	-2,294	4.793	-4,758	0.170	-3,974	16	0,006
T2 pretest-posttest	-4,222	5,191	-8,212	-,232	-3,440	8	0,041
T3 pretest-posttest	-8,833	3,400	-5,524	0.857	-3,040	17	0,031
T4 pretest-posttest	-2.000	3.343	-2.662	0.662	-5.269	17	0.002
T5 pretest-posttest	2.263	6.035	-.646	5.172	1.634	18	0.12

The results of the paired sample t-test show a significant difference in satisfaction levels between the pretest and posttest in most treatments. In the Teaching Game for Understanding method with a reproductive style (T1), the mean difference between the pretest and posttest is -2.294 with a standard deviation of 4.793 and a 95% confidence interval between -4.758 and 0.170. The t-value of -3.974 with 16 degrees of freedom (df) indicates significance at p = 0.006, meaning a significant improvement. In the Teaching Game for Understanding method with a productive style (T2), the mean difference between pretest and posttest is -4.222 (standard deviation = 5.191) with a 95% confidence interval from -8.212 to -0.232. The t-value of -3.440 (df = 8) shows significance at p = 0.041, indicating a significant improvement.

The Project-Based Learning method with a reproductive style (T3) has a mean difference of -8.833 (standard deviation = 3.400) with a confidence interval between -5.524 and 0.857, a t-value of -3.040

(df = 17), and p = 0.031, which indicates a significant change. In the productive style (T4), the mean difference is -2.000 (standard deviation = 3.343), with a confidence interval between -2.662 and 0.662, a t-value of -5.269 (df = 17), and p = 0.002, showing a significant improvement. In contrast, the conventional method (T5) shows a mean difference of 2.263 (standard deviation = 6.035) with a confidence interval between -0.646 and 5.172, a t-value of 1.634 (df = 18), and p = 0.12, which is not statistically significant. These results indicate that significant improvements in satisfaction generally occur with innovative methods, while the conventional method does not show any significant difference.

Discussion

This study shows that innovative teaching methods such as TGfU and PjBL are more effective in increasing student satisfaction than conventional methods. TGfU encourages students to understand the game through the exploration of basic concepts, which develops critical thinking and tactical skills and increases motivation and self-perception. Through PjBL learning, students gain learning experiences to solve problems and solve them with critical thinking. Meanwhile, conventional learning emphasizes instructions that are more dominant from the teacher.

In this study, TGfU with a reproductive style has a significant effect on increasing student satisfaction. TGfU provides opportunities for students to learn technical skills in sports and understand basic concepts and strategies in games (Pan et al., 2023). Meanwhile, by combining a reproductive learning style, teachers can reinforce basic skills that are already known, and teachers play an active role in providing constructive suggestions, opportunities, and repetitions to perform movement tasks. The active role of teachers combined with fun learning can increase student confidence so that they are more motivated to learn, which ultimately leads to student satisfaction (Gómez Buendía et al., 2021).

The combination of TGfU with a productive teaching style also has a significant impact on student satisfaction. The productive teaching style emphasizes empowering students to explore and find solutions in the context of the game. Through the freedom given, students can be creative in developing strategies to master learning tasks so that students are more active in learning. The learning freedom obtained from the combination of these models ultimately increases student satisfaction (Moral-Garcia et al., 2021). The research findings indicate that the productive style in TGfU enhances student engagement because they are free to develop tactics and strategies according to their understanding (Gaspar et al., 2021; Gil-Arias et al., 2017).

The combination of PjBL with a reproductive teaching style can increase student satisfaction. Teachers can provide clear directions regarding the stages of completing the project so that students better understand the tasks given (Hakim et al., 2023). Through the reproductive style, teachers help students evaluate the results of the project and provide positive feedback. This combination creates a learning experience that is directed and meaningful and provides positive achievements that contribute to student satisfaction (Distyasa et al., 2021).

The combination of PjBL with a productive teaching style can also increase student satisfaction. With a productive teaching style, students not only receive instructions from the teacher but also play an active role in designing, developing, and completing the project. Students are creative in completing challenging projects and increasing social interaction because learning is done in groups (Ahmadi et al., 2023). Success in completing the project provides a sense of self-confidence that ultimately fosters student satisfaction.

The findings of this study can be further strengthened through the views of Self-Determination Theory (SDT), which emphasizes the role of autonomy, competence, and relatedness in fostering intrinsic motivation and satisfaction in learning. When students are given greater freedom and control over their learning process, they are likelier to demonstrate higher engagement, motivation, and enjoyment (Perera, 2022; Reeve, 2012). In this study, the productive teaching style in TGfU and PjBL aligns with the autonomy-supportive principles of SDT, as it allows students to make decisions, solve problems, and take ownership of the student learning experience. Moreover, the findings of this study are also in line with the social constructivist perspective, which highlights that knowledge is actively built through interaction, collaboration, and contextual experiences (Hmelo-Silver & Barrows, 2008). The collaborative and inquiry-based nature of TGfU and PjBL not only enhances cognitive engagement but

also creates meaningful social interactions that reinforce satisfaction in the learning process (Sa'bani & Santoso, 2024). This alignment indicates that student-centered pedagogical models are effective not only from a motivational standpoint, as explained by SDT, but also from a socio-cognitive dimension, as emphasized by constructivist theory.

A sense of autonomy increases students' intrinsic motivation, leading to greater satisfaction and long-term commitment to physical education activities (Shen et al., 2009). In contrast, while still effective in providing structure and guidance, reproductive teaching styles may not fully optimize students' intrinsic motivation, as these teaching styles are more teacher-directed. These findings support the idea that by incorporating a student-centered approach in physical education, students have active participation, decision-making opportunities, and creative exploration can result in a more meaningful, enjoyable, and engaging learning experience, which can ultimately foster sustained interest in physical activity and sport.

Unlike TGfU and PjBL, conventional methods are less effective in increasing student satisfaction. In the learning process, students do not get the opportunity to be creative because they listen to the teacher's instructions more often. In addition, learning materials are presented monotonously due to the lack of material development; there is no room for interaction between groups, and more attention is paid to the final result, which burdens students (Ezeddine et al., 2023; Hidajat et al., 2020).

Although this study has been carried out carefully, research limitations cannot be avoided. Emotional factors such as mood, intrinsic motivation, and student perceptions of satisfaction have not been considered in this study so data bias can occur. Therefore, future research is recommended to use longitudinal studies by paying attention to students' emotional factors.

Conclusions

The combination of TGfU and PjBL with reproductive and productive teaching styles significantly increased student satisfaction compared to conventional learning methods. Tgfu provides joy to students during the learning process, while PjBL provides opportunities for creativity. This study provides positive insights for physical education teachers to consider TGfU and PjBL in increasing student satisfaction in physical education learning. For further research, it is recommended to use a longitudinal research design to determine the long-term impact.

Acknowledgements

Thanks are expressed to all parties who made this research a success, especially the physical education teachers and elementary school students who volunteered to participate.

Conflict of interest

The authors declare there is no conflict of interest.

References

Adipat, S., Laksana, K., Busayanon, K., Ausawasowan, A., & Adipat, B. (2021). Engaging Students in the Learning Process with Game-Based Learning: The Fundamental Concepts. *International Journal of Technology in Education*, *4*(3), 542–552. https://doi.org/10.46328/ijte.169

Ahmadi, G., Mohammadi, A., Asadzandi, S., Shah, M., & Mojtahedzadeh, R. (2023). What Are the Indicators of Student Engagement in Learning Management Systems? A Systematized Review of the Literature. *International Review of Research in Open and Distributed Learning*, *24*(1), 117–136. https://doi.org/10.19173/irrodl.v24i1.6453

Baena-Extremera, A., & Granero-Gallegos, A. (2015). Modelo de predicción de la satisfacción con la educación física y la escuela. *Revista de Psicodidactica*, *20*(1), 177–192. https://doi.org/10.1387/RevPsicodidact.11268

Batez, M., Petrušič, T., Bogataj, Š., & Trajković, N. (2021). Effects of Teaching Program Based on Teaching Games for Understanding Model on Volleyball Skills and Enjoyment in Secondary School Students. *Sustainability*, *13*(2), 606. https://doi.org/10.3390/su13020606

Coyne, J., Hollas, T., & Potter, J. P. (2016). Jumping In: Redefining Teaching and Learning in Physical Education Through Project-Based Learning: Column Editor: Anthony Parish. *Strategies*, *29*(1), 43–46. https://doi.org/10.1080/08924562.2016.1113910

Distyasa, M. J. E., Winanti, E. T., Buditjahjanto, I. G. P. A., & Rijanto, T. (2021). The effect of project-based blended learning (PJB2L) learning model on students learning outcomes. *International Journal for Educational and Vocational Studies*, *3*(4), 268. https://doi.org/10.29103/ijevs.v3i4.3959

Duda, J. L., & Nicholls, J. G. (1992). Dimensions of Achievement Motivation in Schoolwork and Sport. *Journal of Educational Psychology*, *84*(3), 290–299. https://doi.org/10.1037/0022-0663.84.3.290

Elumalai, G., Chinanapan, K., Choeibuakaew, W., Iqbal, D. R., & Abadi, F. H. (2022). Can Model-Based Approach in Physical Education Improve Physical Fitness, Academic Performance, and Enjoyment among Pupils? A Systematic Literature Review. *International Journal of Human Movement and Sports Sciences*, *10*(4), 21–28. https://doi.org/10.13189/saj.2022.101304

Ezeddine, G., Souissi, N., Masmoudi, L., Trabelsi, K., Puce, L., Clark, C. C. T., Bragazzi, N. L., & Mrayah, M. (2023). The problem-solving method: Efficacy for learning and motivation in the field of physical education. *Frontiers in Psychology*, *13*, 1–10. https://doi.org/10.3389/fpsyg.2022.1041252

Fonseca, I., Caviedes, M., Chantré, J., & Bernate, J. (2023). Gamification and Game-Based Learning as Cooperative Learning Tools: A Systematic Review. *International Journal of Emerging Technologies in Learning (IJET)*, *18*(21), 4–23. https://doi.org/10.3991/ijet.v18i21.40035

Gaspar, V., Gil-Arias, A., Del Villar, F., Práxedes, A., & Moreno, A. (2021). How tgfu influence on students' motivational outcomes in physical education? A study in elementary school context. *International Journal of Environmental Research and Public Health*, *18*(10), 1–14. https://doi.org/10.3390/ijerph18105407

Gil-Arias, A., Harvey, S., Cárceles, A., Práxedes, A., & Del Villar, F. (2017). Impact of a hybrid TGfU-Sport Education unit on student motivation in physical education. *PLoS ONE*, *12*(6), 1–17. https://doi.org/10.1371/journal.pone.0179876

Gómez Buendía, Á., Sánchez-Alcaraz Martínez, B. J., Cifo Izquierdo, M. I., & Gómez Mármol, A. (2021). Effects of a hybrid teaching model (SEM + TGfU) and the model of personal and social responsibility on sportsmanship and enjoyment in 4° Secondary and 1° Baccalaureate students (Efectos de un modelo híbrido de enseñanza (MED + TGfU) y el modelo de respon. *Retos*, *43*(1995), 550–559. https://doi.org/10.47197/retos.v43i0.85928

Hakim, L., Gede, I., Utamayasa, D., Triatmojo, M., & Megawati, I. (2023). Physical education learning is based on a base project to improve student literacy and numeracy. *Jurnal Penelitian Pembelajaran*, *9*(1), 26–39.

Hardiansyah, S., Kusmaedi, N., Ma'mun, A., Subarjah, H., Syahriadi, S., & Saputra, D. R. (2025). Effectiveness of integrated learning, problem-based learning, and direct learning models on HOTS in badminton. *Retos*, *68*, 1913–1926. https://doi.org/10.47197/retos.v68.109207

Hidajat, H. G., Hanurawan, F., Chusniyah, T., & Rahmawati, H. (2020). Why i'm bored in learning? Exploration of students' academic motivation. *International Journal of Instruction*, *13*(3), 119–136. https://doi.org/10.29333/iji.2020.1339a

Hmelo-Silver, C. E., & Barrows, H. S. (2008). Facilitating Collaborative Knowledge Building. *Cognition and Instruction*, *26*(1), 48–94. https://doi.org/10.1080/07370000701798495

Invernizzi, P., Crotti, M., Bosio, A., Cavaggioni, L., Alberti, G., & Scurati, R. (2019). Multi-Teaching Styles Approach and Active Reflection: Effectiveness in Improving Fitness Level, Motor Competence, Enjoyment, Amount of Physical Activity, and Effects on the Perception of Physical Education Lessons in Primary School Children. *Sustainability*, *11*(2), 405. https://doi.org/10.3390/su11020405

Invernizzi, P. L., Crotti, M., Bosio, A., Cavaggioni, L., Alberti, G., & Scurati, R. (2019). Multi-teaching styles approach and active reflection: Effectiveness in improving fitness level, motor competence, enjoyment, amount of physical activity, and effects on the perception of physical education lessons in primary school children. *Sustainability*, *11*(2), 1–20. https://doi.org/10.3390/su11020405

Morales-Sánchez, V., Hernández-Martos, J., Reigal, R. E., Morillo-Baro, J. P., Caballero-Cerbán, M., & Hernández-Mendo, A. (2021). Physical self-concept and motor self-efficacy are related to satisfaction/enjoyment and boredom in physical education classes. *Sustainability (Switzerland)*, *13*(16), 1–9. https://doi.org/10.3390/su13168829

Moral-Garcia, J. E., Jiménez, A., Cabaco, A. S., & Jiménez-Eguizabal, A. (2021). The role of physical activity and school physical education in enhancing school satisfaction and life satisfaction. *International Journal of Environmental Research and Public Health*, *18*(4), 1–13. https://doi.org/10.3390/ijerph18041689

Muska Mosston, & Sara Ashworth. (2010). *Teaching physical education* (2nd ed.). Benjamin-Cummings Pub.

Pan, Y. H., Huang, C. H., & Hsu, W. T. (2023). A comparison of the learning effects between TGfU-SE and TGfU on learning motivation, sport enjoyment, responsibility, and game performance in physical education. *Frontiers in Psychology*, *14*(July), 1–13. https://doi.org/10.3389/fpsyg.2023.1165064

Perera, K. D. R. L. J. (2022). Application of SDT to Promote Students Motivation and Engagement in Learning: Non-Asian and Asian Contexts. *Asian Review of Social Sciences*, *11*(1), 17–21. https://doi.org/10.51983/arss-2022.11.1.2935

Pill, S., SueSee, B., & Davies, M. (2024). The Spectrum of Teaching Styles and models-based practice for physical education. *European Physical Education Review*, *30*(1), 142–155. https://doi.org/10.1177/1356336X231189146

Reeve, J. (2012). A Self-determination Theory Perspective on Student Engagement. In *Handbook of Research on Student Engagement* (pp. 149–172). Springer US. https://doi.org/10.1007/978-1-4614-2018-7_7

Ritonga, I., Gusril, G., Kiram, Y., Lanos, M. E. C., & Festiawan, R. (2024). Designing an innovative learning model for fundamental throwing and catching skills using the teaching games for understanding (tgfu) approach in elementary education. *Retos*, *61*, 448–454. https://doi.org/10.47197/retos.v61.108823

Román, M. L., Muñoz, S. L., & Castuera, R. J. (2019). The importance of assigning responsibility during evaluation in order to increase student satisfaction from physical education classes: A structural equation model. *PLoS ONE*, *14*(9), 1–16. https://doi.org/10.1371/journal.pone.0209398

Sa'bani, A. N., & Santoso, N. (2024). The Effect of Teaching Games for Understanding (TGFU) Learning Model and Problem-Based Learning (PBL) Model towards the Social Skills and Basketball Playing Skills. *International Journal of Multidisciplinary Research and Analysis, 07*(12). https://doi.org/10.47191/ijmra/v7-i12-46

Septaliza, D., Muslimin, M., & Dwi Susilo Nugroho. (2024). The Implementation of Project based Learning in Physical Education at Elementary Schools. *Kinestetik : Jurnal Ilmiah Pendidikan Jasmani*, *8*(2), 301–309. https://doi.org/10.33369/jk.v8i2.33998

Shen, B., McCaughtry, N., Martin, J., & Fahlman, M. (2009). Effects of Teacher Autonomy Support and Students' Autonomous Motivation on Learning in Physical Education. *Research Quarterly for Exercise and Sport*, *80*(1), 44–53. https://doi.org/10.1080/02701367.2009.10599528

Wilson, H. K., & Cotgrave, A. (2016). Factors that influence students' satisfaction with their physical learning environments. *Structural Survey*, *34*(3), 256–275. https://doi.org/10.1108/SS-01-2016-0004

Authors' and translators' details:

Cahyo Wibowo	cahyo.wibowo@uksw.edu	Author
Arizky Ramadhan	arizkyramadhan@fkip.unsri.ac.id	Author
Yahya Eko Nopiyanto	yahyaekonopiyanto@unib.ac.id	Author
Kukuh Pambuka Putra	kukuh.pambuka@uksw.edu	Author
Yusuf Hartanto	yusufhartanto260@gmail.com	Author
Sanfia Tesabela Messakh	sanfia.messakh@uksw.edu	Author
Dennys Christovel Dese	dennys.christovel@uksw.edu	Author
Priska Lydia Sulistyawati Pulungan	priska.pulungan@uksw.edu	Author
Sufiyandi	sufiyandi@unib.ac.id	Translator