

Teaching Game for Understanding (TGfU) Learning Design for Basketball Games in Physical Education

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Abstract The concept of teaching in physical education has evolved from a teacher-centered approach to a more student-centered approach to develop problem-solving skills and critical thinking in games. This study aims to provide insight and better understand the TGfU pedagogical process of in-game teaching. The method used is a quasi-experimental mixed-methods with a pre-test and post-test design and involves 43 students consisting of (21 girls and 22 boys). The results of the study based on the average difference test on female students showed that the decision-making variable value $t = 28,06$, technical execution 17,01, game performance 29,06, enjoyment 17,87 significantly $\alpha = 0,05$ is 1,721. Male students, the value of decision-making 18,56, technical execution 13,54, game performance 13,53, and enjoyment 16,15 significantly $\alpha = 0,05$ is 1,782. All variables give students the ability to solve learning problems. Students can think to make decisions, be actively involved in the game, have opportunities to learn basketball game techniques well, and participate in game patterns when attacking or defending in the TGfU unit. TGfU also provides enjoyment for students in the physical education learning process in basketball games. The advantage of using the TGfU approach can provide ideas for teachers to make game designs so that students are effectively involved in this unit, and students' abilities and skills in learning the game of basketball can be achieved.

Keywords TGfU, Making-Decision, Technical

Execution, Game Performance, Enjoyment, Basketball

1. Introduction

In the last few decades the concept of physical education learning has changed and developed. The perspective of the teaching and learning process has evolved from a teacher-centered approach to a student-centered approach to encourage the development of problem-solving skills and critical thinking skills. Learning physical education focused on lesson planning, resource management, and class organization [1]. To perform the role as a teacher must have challenges in developing pedagogical relationships with other teacher members because physical education teaching is built on a constructive, collaborative, and inquiry premise [2]. Knowledge of subject matter delivered by teachers will build their knowledge with the learning environment. The environment in schooling serves to strengthen Physical Education by reaffirming current practices [3]. The teacher's physical education lesson time focuses on developing skills and knowledge so that children are encouraged to be active inside and outside the classroom during the learning process [4].

Feedback and reinforcement procedure provides a promising method to maximize practice and learning and accurately assess the progress of talented [5]. Any idea about the implications for learning or to improve the

transfer between practice tasks to the context of performance [6]. Physical education learning models suggest various approaches to attract the attention of teachers widely. Various learning approaches can be applied but must lead to the goal of developing students' skills and knowledge. Although most teachers have applied various learning approaches, not all of them have gone as expected. The model simply puts things in order and keeps the instructor on track within the framework of the lesson [7]. The learning activities section can teach students various ways or strategies to learn about skills, concepts, or activities during physical education [8]. Teachers need to be more selective in their choices of pedagogical approaches in physical education and its commitment to helping all students learn across the different learning domains (i.e., physical, cognitive, social and affective) [9]. In the inquiry method, it is apparent that the students, besides enhancing their motivation, and engagement in physical education, also enhanced both physical and cognitive learning, and communicative skills [10].

The popular model advocating an approach to physical education, Teaching Games for Understanding (TGfU), has attracted widespread teacher attention to support a 'tactical and technical approach to a game. Students learn to play games and understand how the TGfU approach can be applied to game learning during physical education teaching. Constructivist views regarding TGfU had more consideration for student skill level and skill development [11]. TGfU has a powerful central focus on the nature of learning activities undertaken by each individual learner [12]. Secondary school teachers incorporated the key features of TGfU into their games teaching practice [13]. Game-situated teaching and learning led to faster responses and quicker reactions within the game environment to movements of the ball and/or team-mates [14].

Basketball is a team sport that can be played by junior high school students, but in playing this sport students are less courageous in making decisions, for example shooting into the ring, or dribbling even though they have mastered the technique. Based on the results of previous research, there is a discussion about TGfU and the results can be used as a reference to make research on student decision making in a game. So the researchers chose TGfU in the application of physical education teaching in basketball games.

The ability of male and female students is indeed different in understanding and practicing a game. So in this study, we want to know the TGfU model so that it can be a solution in physical education learning in understanding and practicing basketball games. Physical education (PE) teachers perceive the utility and quality of key features of TGfU differently, resulting in various pragmatic forms of TGfU in school [15]. Innovative learning designs are needed so that the exercises carried out by students can get maximum results. Teachers must also design a systematic lesson plan and the expectations to be achieved with the

abilities, skills and enjoyment of students during physical education taken into account. The teachers were motivated to use digital game design principles to provide students with the means to solve problems, manage learning motivations, evaluate progress, and gain control over their learning [16]. Teachers have to take into account students' skill levels when designing their lessons because, if small-sided games are adequately considered and managed, students' learning processes can be enhanced [17].

2. Method

2.1. Participants

The sample that took part in this study was high school students totaling 43 students (22 boys and 21 girls). The procedure for obtaining the experimental group uses purposive sampling to produce samples that can represent the population. After getting the required sample, the researcher then conducted a pretest to see the initial skills. Students who were divided into two groups of boys and girls were all given TGfU learning to improve the game performance of each group.

2.2. Research Design

The research method used in this study is a quasi-experimental mixed-methods with pre-test and post-test designs. This method is used to determine the effect of the TGfU learning model applied to improve game performance in basketball games. Assigning subjects randomly to the treatment levels so that known and unsuspected sources of variation among the subjects are distributed over the entire experiment and do not affect the subjects in just one or a limited number of treatment levels [18].

2.3. Instrument and Data Analysis

Game Performance Assessment Instruments, decision-making (player passes the ball to a free teammate and the player stops the attack by being able to grab the ball), technical execution (dribbling correctly, making a successful pass, helping the team in possession and attacking), games performance (right decision to shoot and get points, right skills in attacking and defending, for example choosing to pass, dribbling or shooting into the basketball hoop), enjoyment (a) after practicing basketball, I felt pretty competent, (b) I think I am pretty good at practicing basketball, (c) I am satisfied with my performance in basketball, and (d) I am pretty skilled in practicing basketball. Agreement with the items was rated on a 4-point Likert-type scale, ranging from 1 (strongly disagree) to 4 (strongly agree). The assessment instrument was adopted from research on improvement in in-game performance TGfU floorball unit in physical education

[19]. Assessment is carried out by 3 observers during the game. The three observers are colleagues in this study who are members of lecturers in the sports science faculty. The significant value $\alpha = 0.05$ at t-tables 22 and 21 is (1.782 and 1.721). The qualitative instrument focused on interviews with students and teachers. Analysis of quantitative data using t-test and qualitative data manual analysis.

After the students practiced the basketball game with the TGfU concept, the researcher conducted interviews with each student. The researcher only took 11 students to be interviewed. The interview was recorded on video. Qualitative data were analyzed by data reduction to simplify the data according to the need for easy access to information.

3. Results

The purpose of this study was to see whether students' game performance increased in the variables of decision-making, technical execution, game performance, and enjoyment after the implementation of TGfU. The hypothesis is that students' abilities will increase according to the variables that determine the basketball game after the implementation of TGfU on male and female students. Before analyzing the hypothesis, the data that has been collected is analyzed for homogeneity. homogeneity test using the Bartlett formula which shows the results that $X^2_{(0.05)} 5.99 > X^2 1.27$. So that the research data is homogeneous. Based on the results of the analysis all variables can increase significantly in the post-test. The main findings of this study are shown in table 1.

Table 1. Means, standard deviations, and significant differences in the variables

Variable	Woman				t	t-table	Man				t	t-table
	Pre-test		Post-test				Pre-test		Post-test			
	Mean	SD	Mean	SD			Mean	SD	Mean	SD		
Decision-making	3,45	0,51	6,18	0,66	28,06	1,721	3,77	0,53	7,05	0,79	18,56	1,782
Technical execution	5,77	0,75	9,59	1,10	17,01	1,721	6,36	0,49	10,14	1,08	13,54	1,782
Game performance	5,73	0,70	9,77	0,81	29,06	1,721	6,91	0,75	10,32	1,04	13,53	1,782
Enjoyment	8,00	0,76	12,64	1,26	17,87	1,721	8,45	0,80	13,05	1,25	16,15	1,782

Table 2. Student and Teacher Responses during Interview

Variable	Results
Decision-making	Pupils: "I can pass to a friend who has a free position, and can stop or assist the attack". "I can also make decisions when attacking or defending because I know the limits of the game and position". Teacher: "The strategy to increase the training area and limit the play has helped the team a lot in defense and attack". "There are some differences in attack and defense patterns in male and female students, especially when making decisions".
Technical execution	Pupils: "I know how to dribble, pass, shoot properly to get points, and how to help the team in possession of the ball in the attack". Teacher: "After reflecting on the first lesson, what can be improved and considered important in a game". "I think that through questions about technical execution they have learned that why do you have to do the technique correctly in basketball, so that technique needs to be mastered well".
Game performance	Pupils: "I learned how to play basketball properly, cooperate with my teammates, and can practice techniques to get points, and reduce mistakes during the game". Teacher: "Each group did well". "I see a general improvement in skills after the implementation of the TGfU unit". "I also believe that clear instruction given to students is one of the keys to success in this unit".
Enjoyment	Pupils: "I am interested and feel happy because I can play basketball like other lessons." "Every task given by the teacher is difficult but I can complete it well by trying repeatedly". Teacher: "Activities in this TGfU unit can make students actively play and all students are involved in it". "Students welcome the TGfU unit as a way to improve basketball game performance".

Based on these results, there are significant differences in each variable between pretest and posttest in men and women. In the decision-making variable, the values of $t = 28.06$ and 18.56 , technical execution 17.01 and 13.54 , game performance 29.06 and 13.53 , enjoyment 17.87 and 16.15 . These results indicate that after TGfU was applied to basketball games there was an improvement in techniques that helped the success of game performance between female and male students. When implementing TGfU students can dribble correctly, pass on target, be more daring to help the team when attacking and defending. This is related to the decision-making made by students during the game which also increased significantly, such as being able to grab the ball and stop the opponent's attack, and daring to pass the ball to a friend in a free position. Interview data is shown in table 2 above.

As said by students and teachers during interviews that decision-making can give students decisions to attack, defend or pass. The strategy applied by the teacher is in the form of a game to provide many opportunities for students to explore their abilities. The TGfU unit also allows students the opportunity to learn how to play basketball correctly so they can control the ball while playing. They have learned how to play basketball well, and are also interested and excited about the implementation of the basketball TGfU unit.

4. Discussion

A structured collaborative decision-making approach for conceptualizing the integration of practice-oriented into preparation teaching programs [20]. Learning task structure provided by the Invasion Games Competence Model offered students a chance to improve skill execution and tactical decision making [21]. The learning design prepared by the physical education teacher is in the form of tasks in a game that is practiced by all students. Teach students the skills need to improve their health literacy and foster the capability to make informed decisions by shifting to a skills-based program [22]. The task can be carried out by students so that they dare to make decisions in a game. The teacher must develop a sense of trust while allowing students to make personal decisions [23]. The potential importance of student decision-making in the establishment of a complete education environment and decision-making opportunities for students relates directly to those higher-order learning [24]. Teachers' employment of a hybrid TGfU unit can encourage students to assume responsibilities and make independent decisions [25].

TGfU practically assists the physical educator to improve games and sports teaching [26]. The effectiveness of the situated game teaching through set plays model in developing students' tactical knowledge as compared to a technique-focused approach [27]. The TGfU unit provides significant differences between male and female students in terms of decision-making and technical execution on

various attack and defense patterns in the context of playing basketball. Significantly male students outperformed women in making decisions when offensive and defensive as seen from the results of the average difference in the significant test between variables. In the implementation of the TGfU unit male students continued to show increased skills than girls in attacking but when defending they were less in making decisions. Although technically, male students are better, in terms of making decisions, female students are more courageous. The modified field and rules of the game can increase student participation in learning [28]. Boys showed higher participation than girls in the competition context [29]. Boys in the tactical games model state showed significantly higher levels of moderate to vigorous physical activity in rugby and soccer activities compared to girls although no significant difference in motivation was noted after the study [30].

The form of the game presented provides a tactical structure for students to improve game performance. In this case, the structure of the TGfU unit can also explain game performance on the components of how to play well, cooperate with teammates, reduce fouls, and get points. Game situations with a superior number of players facilitate decision-making and develop the technical skills thanks to greater participation and a greater duration [31]. Student involvement in this unit will increase but some show lower game performance. Game-play development and the transfer of tactical solutions and decision-making processes across games within the same category were critically and differentially influenced by various situational constraints [32]. Both boys and girls improved in all the gameplay dimensions from the beginning to the end of the season [33]. The best predictive model showed a nonlinear effect of time on student performance such that all participants' levels improved from their first experience in the seventh grade through to the end of the ninth-grade season [34] [35]. If the game time is short, the students will show a good game performance, but if the game time is long, the student's game performance will decrease at the end of the time. That skillful gameplay takes time and the application of more than one unit consecutively over time [36].

Students' perceptions of enjoyment were lower in fitness testing classes compared to physical education in general [37]. This unit also provides fun for students during physical education lessons. They feel happy and enjoy every task given by the teacher. Task orientation and perceived competence had a strong and direct impact on enjoyment [38]. The learning structure carried out by the teacher does give students an active and involved in every game, so they welcome and are satisfied when they can complete the task well. Physical education enjoyment remained relatively high during this period time, the average rating decreased significantly for boys and girls [39]. They can get cooperation with teammates in this unit, so there is social interaction between them. Pedagogical

learning in Physical Education develops students' social bonds by configuring the learning environment to promote social relationships with peers in influencing their decisions while participating in each learning [40]. Training high school PE teachers to facilitate a caring climate in the interest of maximizing optimal student emotions and engagement [41].

Limitations in this study are the absence of a control group as a comparison of research results. Is TGfU really effective in improving decision-making, Technical execution, Game performance and enjoyment in students beyond the research conducted? So that in the future it is necessary to carry out further investigations to obtain more accurate results about the TGfU model.

5. Conclusions

The understanding-based learning approach in the context of the game has provided an understanding for teachers to provide learning designs according to their pedagogical competencies. Teachers can understand the character of students and improve their abilities and skills to overcome pedagogical and curriculum problems in physical education. The contents of this paper provide reasons that the importance of learning design can improve students' understanding and skills in a game. The TGfU unit is proven to be effective in helping students to make decisions and learn about technical execution, game performance and enjoyment of basketball games. In the future, it is necessary for teachers or practitioners must consider using the TGfU approach in the implementation of physical education learning.

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REFERENCES

- [1] F. Murphy, S. Marron, and M. Coulter, "Primary field experiences: Critical for primary generalist physical education teachers?," *https://doi.org/10.1177/1356336X21991188*, vol. 27, no. 4, pp. 761–778, Feb. 2021, doi: 10.1177/1356336X21991188.
- [2] M. Amaral-da-Cunha, A. Graça, P. Batista, and A. MacPhail, "Giving birth to a supervisory identity built upon pedagogical perspectives on teaching: The case of a novice physical education cooperating teacher.," *https://doi.org/10.1177/1356336X19857181*, vol. 26, no. 2, pp. 353–374, Jul. 2019, doi: 10.1177/1356336X19857181.
- [3] G. Ward and G. Griggs, "Primary Physical Education: A memetic perspective.," *https://doi.org/10.1177/1356336X16676451*, vol. 24, no. 4, pp. 400–417, Apr. 2017, doi: 10.1177/1356336X16676451.
- [4] A. Abdulla, P. R. Whipp, and T. Teo, "Teaching physical education in 'paradise': Activity levels, lesson context and barriers to quality implementation.," *https://doi.org/10.1177/1356336X211033696*, Jul. 2021, doi: 10.1177/1356336X211033696.
- [5] J. E. Holt, G. Kinchin, and G. Clarke, "Effects of peer-assessed feedback, goal setting and a group contingency on performance and learning by 10–12-year-old academy soccer players.," *https://doi.org/10.1080/17408989.2012.690568*, vol. 17, no. 3, pp. 231–250, Jun. 2012, doi: 10.1080/17408989.2012.690568.
- [6] A. Práxedes, D. Pizarro, B. Travassos, M. Domínguez, and A. Moreno, "Level of opposition constrains offensive performance in consecutive game situations. An analysis according to game principles.," *https://doi.org/10.1080/17408989.2021.1877269*, 2021, doi: 10.1080/17408989.2021.1877269.
- [7] E. H. Statt, O. K. Plummer, and R. D. Marinelli, "A Circle of Learning in Sport Instruction.," *http://dx.doi.org/10.1080/07303084.2001.10605849*, vol. 72, no. 3, pp. 34–37, Mar. 2013, doi: 10.1080/07303084.2001.10605849.
- [8] R. D. Shrader, "Individualized Approach to Learning.," *http://dx.doi.org/10.1080/00221473.1971.10613994*, vol. 42, no. 7, pp. 33–36, Sep. 2013, doi: 10.1080/00221473.1971.10613994.
- [9] A. M. Rady and G. Schmidt, "Recruiting Future Physical Education Teachers Through Experiential Learning.," *http://dx.doi.org/10.1080/07303084.2011.10598652*, vol. 82, no. 7, pp. 13–56, Sep. 2013, doi: 10.1080/07303084.2011.10598652.
- [10] [10] L. D. Østergaard, "Inquiry-based Learning Approach in Physical Education: Stimulating and Engaging Students in Physical and Cognitive Learning.," *https://doi.org/10.1080/07303084.2015.1119076*, vol. 87, no. 2, pp. 7–14, Feb. 2016, doi:10.1080/07303084.2015.1119076.
- [11] L. Wang and A. S. Ha, "Three groups of teachers' views, learning experiences, and understandings of teaching games for understanding.," *http://dx.doi.org/10.1080/17408989.2012.666789*, vol. 18, no. 3, pp. 336–350, 2013, doi: 10.1080/17408989.2012.666789.
- [12] I. Renshaw, D. Araújo, C. Button, J. Y. Chow, K. Davids, and B. Moy, "Why the Constraints-Led Approach is not Teaching Games for Understanding: a clarification.," *http://dx.doi.org/10.1080/17408989.2015.1095870*, vol. 21, no. 5, pp. 459–480, Sep. 2015, doi: 10.1080/17408989.2015.1095870.
- [13] L. M. García-López, D. Gutiérrez, D. Sánchez-Mora, and S. Harvey, "Teachers' use of teaching games for understanding in Central Spain.," *https://doi.org/10.1080/17408989.2019.1628931*, vol. 24, no. 5, pp. 463–477, Sep. 2019, doi: 10.1080/17408989.2019.1628931.
- [14] S. Harvey, C. J. Cushion, H. M. Wegis, and A. N. Massa-Gonzalez, "Teaching games for understanding in American high-school soccer: a quantitative data analysis

- using the game performance assessment instrument.” <https://doi.org/10.1080/17408980902729354>, vol. 15, no. 1, pp. 29–54, Jan. 2009, doi: 10.1080/17408980902729354.
- [15] L. M. García-López, D. Gutiérrez, D. Sánchez-Mora, and S. Harvey, “Teachers’ use of teaching games for understanding in Central Spain,” <https://doi.org/10.1080/17408989.2019.1628931>, vol. 24, no. 5, pp. 463–477, Sep. 2019, doi: 10.1080/17408989.2019.1628931.
- [16] [16] S. Pill, B. Hyndman, B. SueSee, and J. Williams, “Physical Education Teachers’ Use of Digital Game Design Principles,” *J. Teach. Phys. Educ.*, vol. 40, no. 1, pp. 1–9, Dec. 2019, doi: 10.1123/JTPE.2019-0036.
- [17] F. Sgrò, R. Coppola, R. Schembri, and M. Lipoma, “The effects of a tactical games model unit on students’ volleyball performances in elementary school:” <https://doi.org/10.1177/1356336X211005806>, vol. 27, no. 4, pp. 1000–1013, Apr. 2021, doi: 10.1177/1356336X211005806.
- [18] R. E. Kirk, “Experimental Design,” in *Handbook of Psychology, Second Edition*, Hoboken, NJ, USA: John Wiley & Sons, Inc., 2012.
- [19] M. T. Morales-Belando, A. Calderón, and J. L. Arias-Estero, “Improvement in game performance and adherence after an aligned TGfU floorball unit in physical education,” *Phys. Educ. Sport Pedagog.*, vol. 23, no. 6, pp. 657–671, 2018, doi: 10.1080/17408989.2018.1530747.
- [20] E. Jones, K. Gaudreault, M. Henninger, and S. Williams, “Think Tank Sessions: Using Structured Decision Making to Inform PETE Program Revisions,” <https://doi.org/10.1080/07303084.2018.1546633>, vol. 90, no. 2, pp. 17–23, Feb. 2019, doi: 10.1080/07303084.2018.1546633.
- [21] I. Mesquita, C. Farias, and P. Hastie, “The impact of a hybrid Sport Education–Invasion Games Competence Model soccer unit on students’ decision making, skill execution and overall game performance:” <http://dx.doi.org/10.1177/1356336X12440027>, vol. 18, no. 2, pp. 205–219, May 2012, doi: 10.1177/1356336X12440027.
- [22] J. C. J. A. J. Egan, “CT Elementary Students to Learn ‘G.R.E.A.T’ Decision-Making Skills for Health and Personal Safety,” <https://doi.org/10.1080/07303084.2018.1510211>, vol. 89, no. 8, pp. 3–4, Oct. 2018, doi: 10.1080/07303084.2018.1510211.
- [23] W. C. Sparks, “Promoting Self-Responsibility and Decision Making with At-Risk Students,” <http://dx.doi.org/10.1080/07303084.1993.10606711>, vol. 64, no. 2, pp. 74–78, Feb. 2013, doi: 10.1080/07303084.1993.10606711.
- [24] S. M. Bulger, J. S. Townsend, and L. M. Carson, “Promoting Responsible Student Decision-Making in Elementary Physical Education,” <http://dx.doi.org/10.1080/07303084.2001.10605781>, vol. 72, no. 7, pp. 18–23, Sep. 2013, doi: 10.1080/07303084.2001.10605781.
- [25] A. Gil-Arias, F. Claver, A. Práxedes, F. Del Villar, and S. Harvey, “Autonomy support, motivational climate, enjoyment and perceived competence in physical education: Impact of a hybrid teaching games for understanding/sport education unit:” <https://doi.org/10.1177/1356336X18816997>, vol. 26, no. 1, pp. 36–53, Dec. 2018, doi: 10.1177/1356336X18816997.
- [26] S. Stolz and S. Pill, “Teaching games and sport for understanding: Exploring and reconsidering its relevance in physical education,” <http://dx.doi.org/10.1177/1356336X13496001>, vol. 20, no. 1, pp. 36–71, Aug. 2013, doi: 10.1177/1356336X13496001.
- [27] F. Dervent, X. Xie, E. Devrilmez, N. Nayır, and W. Li, “Effects of Situated Game Teaching Through Set Plays on Soccer Tactical Knowledge Among Turkish Secondary School Students,” *J. Teach. Phys. Educ.*, vol. 1, no. aop, pp. 1–9, Aug. 2021, doi: 10.1123/JTPE.2021-0042.
- [28] D. Tya, M. Ningrum, J. Tangkudung, J. Lubis, A. R. Riza, and E. T. Denatara, “The Effectiveness of Small Side Games (SSG) in Forearm Pass Volleyball Use Application in Mobile Phone,” *International Journal of Human Movement and Sports Sciences*, vol. 9, no. 4, pp. 642–647, 2021, doi: 10.13189/saj.2021.090406.
- [29] C. Farias, Y. Segovia, C. Valério, and I. Mesquita, “Does Sport Education promote equitable game-play participation? Effects of learning context and students’ sex and skill-level:” <https://doi.org/10.1177/1356336X211013832>, May 2021, doi: 10.1177/1356336X211013832.
- [30] L. Smith, S. Harvey, L. Savory, S. Fairclough, S. Kozub, and C. Kerr, “Physical activity levels and motivational responses of boys and girls: A comparison of direct instruction and tactical games models of games teaching in physical education,” <http://dx.doi.org/10.1177/1356336X14555293>, vol. 21, no. 1, pp. 93–113, Oct. 2014, doi: 10.1177/1356336X14555293.
- [31] A. Práxedes, D. Pizarro, B. Travassos, M. Domínguez, and A. Moreno, “Level of opposition constrains offensive performance in consecutive game situations. An analysis according to game principles,” *Phys. Educ. Sport Pedagog.*, 2021, doi: 10.1080/17408989.2021.1877269.
- [32] C. F. G. Farias, S. Harvey, P. A. Hastie, and I. M. R. Mesquita, “Effects of situational constraints on students’ game-play development over three consecutive Sport Education seasons of invasion games,” <https://doi.org/10.1080/17408989.2019.1571184>, vol. 24, no. 3, pp. 267–286, May 2019, doi: 10.1080/17408989.2019.1571184.
- [33] R. Araújo, I. Mesquita, P. Hastie, and C. Pereira, “Students’ game performance improvements during a hybrid sport education–step-game-approach volleyball unit,” *Eur. Phys. Educ. Rev.*, vol. 22, no. 2, pp. 185–200, May 2016, doi: 10.1177/1356336X15597927.
- [34] R. Araújo, P. Hastie, K. R. Lohse, C. Bessa, and I. Mesquita, “The long-term development of volleyball game play performance using Sport Education and the Step-Game-Approach model:” <https://doi.org/10.1177/1356336X17730307>, vol. 25, no. 2, pp. 311–326, Sep. 2017, doi: 10.1177/1356336X17730307.
- [35] A. Miller *et al.*, “Can physical education and physical activity outcomes be developed simultaneously using a game-centered approach?,” <http://dx.doi.org/10.1177/1356336X15594548>, vol. 22, no. 1, pp. 113–133, Jul. 2015, doi: 10.1177/1356336X15594548.
- [36] R. Araújo, I. Mesquita, P. Hastie, and C. Pereira, “Students’ game performance improvements during a hybrid sport education–step-game-approach volleyball unit:” <http://dx.doi.org/10.1177/1356336X15597927>, vol. 22, no. 2, pp. 185–200, Aug. 2015, doi: 10.1177/1356336X15597927.

10.1177/1356336X15597927.

- [37] M. Huhtiniemi *et al.*, "Finnish students' enjoyment and anxiety levels during fitness testing classes," <https://doi.org/10.1080/17408989.2020.1793926>, pp. 1–15, 2020, doi: 10.1080/17408989.2020.1793926.
- [38] C. K. J. Wang and W. C. Liu, "Promoting enjoyment in girls' physical education: The impact of goals, beliefs, and self-determination.," <http://dx.doi.org/10.1177/1356336X07076875>, vol. 13, no. 2, pp. 145–164, Jul. 2016, doi: 10.1177/1356336X07076875.
- [39] J. H. Ishee and C. Couvutsakis, "Children's Enjoyment of Physical Education," <http://dx.doi.org/10.1080/07303084.2003.10608509>, vol. 74, no. 9, pp. 6–6, Nov. 2013, doi: 10.1080/07303084.2003.10608509.
- [40] T. L. Wallhead, A. C. Garn, and C. Vidoni, "Sport Education and social goals in physical education: relationships with enjoyment, relatedness, and leisure-time physical activity," <https://doi.org/10.1080/17408989.2012.690377>, vol. 18, no. 4, pp. 427–441, 2013, doi: 10.1080/17408989.2012.690377.
- [41] K. L. Simonton, A. C. Garn, and N. Washburn, "Caring Climate, Emotions, and Engagement in High School Physical Education," *J. Teach. Phys. Educ.*, vol. 1, no. aop, pp. 1–10, Aug. 2021, doi: 10.1123/JTPE.2021-0086.