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Students' sense of enjoyment for an alternative invasive sport in the educational context

La sensación de disfrute del alumnado para un deporte alternativo de invasión en el contexto educativo

A sensação de desfrute dos alunos por um desporto alternativo de invasão no contexto educativo

教育情境中新型入侵类体育运动中学生愉悦感的研究

إحساس المتعلمين بالمتعة في ممارسة رياضة بديلة من نوع الغزو ضمن السياق التربوي

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Abstract

Enjoyment is a critical factor influencing engagement in physical-sport activities. The objective of this study was to analyse the influence of pedagogical models and gender on the variable of sport enjoyment during the teaching of an alternative invasion game called the "Rosquilla". A total of 136 students from Primary Education (5th and 6th grades) and Secondary Education (1st year) participated, distributed across six groups. Each group at the same grade level was assigned to one of two intervention programs: one based on the Game-Centred Model and the other on a hybrid model combining the Game-Centred Model and the Sports Education Model. Enjoyment was evaluated in two dimensions—positive and negative enjoyment—using the Physical Activity Enjoyment Scale (PACES). The psychometric properties of the scale were assessed through Confirmatory Factor Analysis, Cronbach's alpha, Average Variance Extracted, and Composite Reliability. Descriptive and inferential analyses were performed using a Linear Mixed Model and Bonferroni post hoc tests. The results showed significantly higher levels of positive enjoyment and lower levels of negative enjoyment across both pedagogical models. Significant differences in enjoyment were found depending on the pedagogical model applied. Gender differences were also observed, with boys reporting higher levels of positive enjoyment than girls. These results underscore the importance of teachers designing and implementing interventions that promote student enjoyment in sport programmes to enhance participation, self-determined motivation, and adherence to physical activity. The hybrid model demonstrates the most favourable outcomes, maximizing positive enjoyment and minimizing negative affect.

Keywords: Pedagogical models; enjoyment of Physical Activity; alternative invasive sports, Physical Education.

Resumen

El disfrute es un factor clave de la participación en las actividades físico-deportiva. El objetivo del estudio fue examinar si los modelos pedagógicos y el género influyen en la variable disfrute deportivo en el aprendizaje del deporte alternativo de invasión llamado "La Rosquilla". En el estudio participaron 136 alumnos/as distribuidos en seis grupos de Educación Primaria (5º y 6º curso) y Secundaria (1er curso). Cada grupo del mismo curso participó en un programa diferente, uno basado en el Modelo Centrado en el Juego y el otro en un Modelo de hibridación del Modelo Centrado en el Juego y el Modelo de Educación Deportiva. Las variables, disfrute positivo y negativo, se midieron a través de la Escala de Medida del Disfrute en la Actividad Física (PACES). En el estudio de las propiedades psicométricas de las escalas, se utilizó un Análisis Factorial Confirmatorio, Alfa de Cronbach, Varianza Media Extraída y Fiabilidad Compuesta. Se realizó un análisis descriptivo e inferencial con el Modelo Lineal Mixto y Post Hoc de Bonferroni. Se halló mayor disfrute positivo y menor disfrute negativo a través de los dos modelos. Se mostraron diferencias significativas en el grado de disfrute positivo y negativo según el modelo pedagógico. Se verificaron diferencias significativas en el disfrute positivo respecto al género (niños>niñas). Es crucial que el docente realice una planificación e intervención que fomente el disfrute del alumnado en sus programaciones deportivas para potenciar la motivación autodeterminada, participación y adherencia hacia la actividad deportiva. El Modelo de Hibridación obtiene mayor disfrute positivo y menor disfrute negativo.

Palabras clave: Modelos pedagógicos, disfrute de Actividad Física, deportes alternativos de invasión, Educación Física.

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Resumo

O desfrute é um fator-chave na participação nas atividades físicas e desportivas. O objetivo do estudo foi examinar se os modelos pedagógicos e o género influenciam a variável desfrute desportivo na aprendizagem do desporto alternativo de invasão denominado "La Rosquilla". O estudo envolveu 136 alunos distribuídos por seis turmas do Ensino Básico (5.º e 6.º anos) e Secundário (1.º ano). Cada grupo do mesmo ano participou num programa diferente, um baseado no Modelo Centrado no Jogo e o outro num Modelo de Hibridação do Modelo Centrado no Jogo e do Modelo de Educação Desportiva. As variáveis, desfrute positivo e negativo, foram medidas utilizando a Escala de Medição do Desfrute na Atividade Física (PACES). No estudo das propriedades psicométricas das escalas, utilizou-se uma Análise Factorial Confirmatória, Alfa de Cronbach, Variância Média Extraída e Fiabilidade Composta. Realizou-se uma análise descritiva e inferencial com o Modelo Linear Misto e Post Hoc de Bonferroni. Verificou-se um maior desfrute positivo e um menor desfrute negativo através dos dois modelos. Registaram-se diferenças significativas no grau de desfrute positivo e negativo de acordo com o modelo pedagógico. Verificaram-se diferenças significativas no desfrute positivo em relação ao género (rapazes > raparigas). É crucial que o docente realize um planeamento e uma intervenção que fomente o desfrute dos alunos nos seus programas desportivos, para potenciar a motivação autodeterminada, a participação e a adesão à atividade desportiva. O Modelo de Hibridação obtém maior desfrute positivo e menor desfrute negativo.

Palavras-chave: Modelos pedagógicos, desfrute da Atividade Física, desportos alternativos de invasão, Educação Física.

摘要

愉悦体验是参与体育活动的关键因素。本研究旨在探讨教学模式和性别是否影响学生在学习新型入侵类体育项目“甜甜圈球”过程中的运动愉悦感。研究对象为 136 名学生，分别来自小学五、六年级和初中一年级，共分为六个小组。每个年级的学生分别参与了不同的教学方案，一组采用以游戏为中心的教学模式，另一组采用游戏中心模式与体育教育模式相结合的混合模式。正向和负向愉悦变量通过《体育活动愉悦量表》（PACES）进行测量。对量表的心理测量特性进行了确认性因子分析、Cronbach α 系数、平均方差提取和复合信度分析。描述性和推断性分析采用混合线性模型和 Bonferroni 事后检验。结果表明，两种教学模式均能提升正向愉悦、降低负向愉悦，不同教学模式下的正向和负向愉悦存在显著差异。性别方面，男生的正向愉悦显著高于女生。研究强调，教师应通过科学的教学规划与干预，促进学生在体育课程中的愉悦体验，以增强其自主动机、参与度和对体育活动的持续性。混合教学模式下学生获得了更高的正向愉悦和更低的负向愉悦体。

关键词：教学模式、体育愉悦、新型入侵类运动、体育教育

ملخص

يُعد الشعور بالمتعة عاملًا أساسيًا في مشاركة المتعلمين في الأنشطة البدنية والرياضية. هدفَت هذه الدراسة إلى فحص ما إذا كانت النماذج التربوية والجنس يؤثران في متغير المتعة الرياضية أثناء تعلُّم رياضة بديلة من نوع الغزو تُعرف باسم "لا روسكييا". شارك في الدراسة 136 تلميذًا وتلميذة موزعين على ست مجموعات من التعليم الابتدائي (الصفين الخامس والسادس) والتعليم الثانوي (الصف الأول). شاركت كل مجموعة من نفس المستوى الدراسي في برنامج مختلف، أحدهما قائم على النموذج المرتكز على اللعب، والآخر قائم على نموذج هجين يجمع بين النموذج المرتكز على اللعب ونموذج التربية الرياضية. وفي دراسة *(PACES)* تم قياس متغيري المتعة الإيجابية والسلبية باستخدام مقياس تقييم المتعة في النشاط البدني. الخصائص السيكومترية للمقياس، تم استخدام التحليل العاملي التوكيدي، معامل ألفا كرونباخ، متوسط التباين المُستخرج، والثبات المركب. كما أُجري تحليل وصفي واستدلالي باستخدام النموذج الخطي المختلط واختبار بونفروني البعدي *(Post Hoc)*. وقد أظهرت النتائج مستويات أعلى من المتعة الإيجابية ومستويات أدنى من المتعة السلبية باستخدام كلا النموذجين. كما ظهرت فروق دالة إحصائيًا في درجة المتعة الإيجابية والسلبية تبعًا للنموذج التربوي، وتم التحقق من فروق دالة في المتعة الإيجابية بين الجنسين لصالح الذكور. وتؤكد الدراسة على أهمية أن يحرص المعلم على إعداد خطة تدريسية وتدخل تربوي يعززان شعور المتعلمين بالمتعة في برامجه الرياضية، بهدف تعزيز الدافعية الذاتية، والمشاركة، والارتباط المستمر بالنشاط الرياضي. وقد أظهر النموذج الهجين فاعلية أكبر من حيث رفع المتعة الإيجابية وتقليل المتعة السلبية

الكلمات المفتاحية : الكلمات المفتاحية: النماذج التربوية؛ متعة النشاط البدني؛ الرياضات البديلة من نوع الغزو؛ التربية البدني

Introduction

Physical inactivity is one of the leading causes of major health issues in developed countries (Lluna-Ruiz et al., 2020; Michael et al., 2016; Casajús & Vicente-Rodríguez, 2011). Technology and the increasing use of electronic devices are replacing traditional physical activity during leisure time, resulting in a situation where a significant number of schoolchildren engage in physical activity only at school (Guthold et al., 2020). Physical exercise is a key strategy for improving health and preventing disease, serving as a fundamental tool for promoting well-being (Lluna-Ruiz et al., 2020; Casajús & Vicente-Rodríguez, 2011). Sport provides an appropriate means of encouraging the adoption of an active and healthy lifestyle and has the potential to counteract this trend among young populations (Ramírez et al., 2004).

Enjoyment is regarded as one of the primary reasons why individuals engage in physical and sporting activities (Bai et al., 2018; Burns et al., 2023; Castillo & Balaguer, 2001). It is therefore a critical factor that must be understood to promote sustained participation in physical exercise (Bai et al., 2018; García et al., 2016; Moghaddaszadeh et al., 2017). A lack of enjoyment is among the most frequently cited reasons for sport dropout (Bai et al., 2015, 2018; Cervelló, 2002). Enjoyment is defined as a positive feeling associated with pleasure and fun (Scanlan & Symons, 1992, pp. 202–203). According to Scanlan and Symons (1992), fun influences motivation in sport. Various elements contribute to making sport enjoyable, including experiences of mastery, friendships, and sensations related to movement (Engels & Freund, 2018; Michael et al., 2016). Both intrinsic and extrinsic achievement-related factors can be distinguished: individuals enjoy physical activity when they feel competent in performing a task (intrinsic motivation) (Bai et al., 2015), as well as when they receive external recognition of their competence (extrinsic motivation). In addition, there are non-achievement-related factors that foster enjoyment, such as social interaction through sport (Engels & Freund, 2018; García et al., 2016).

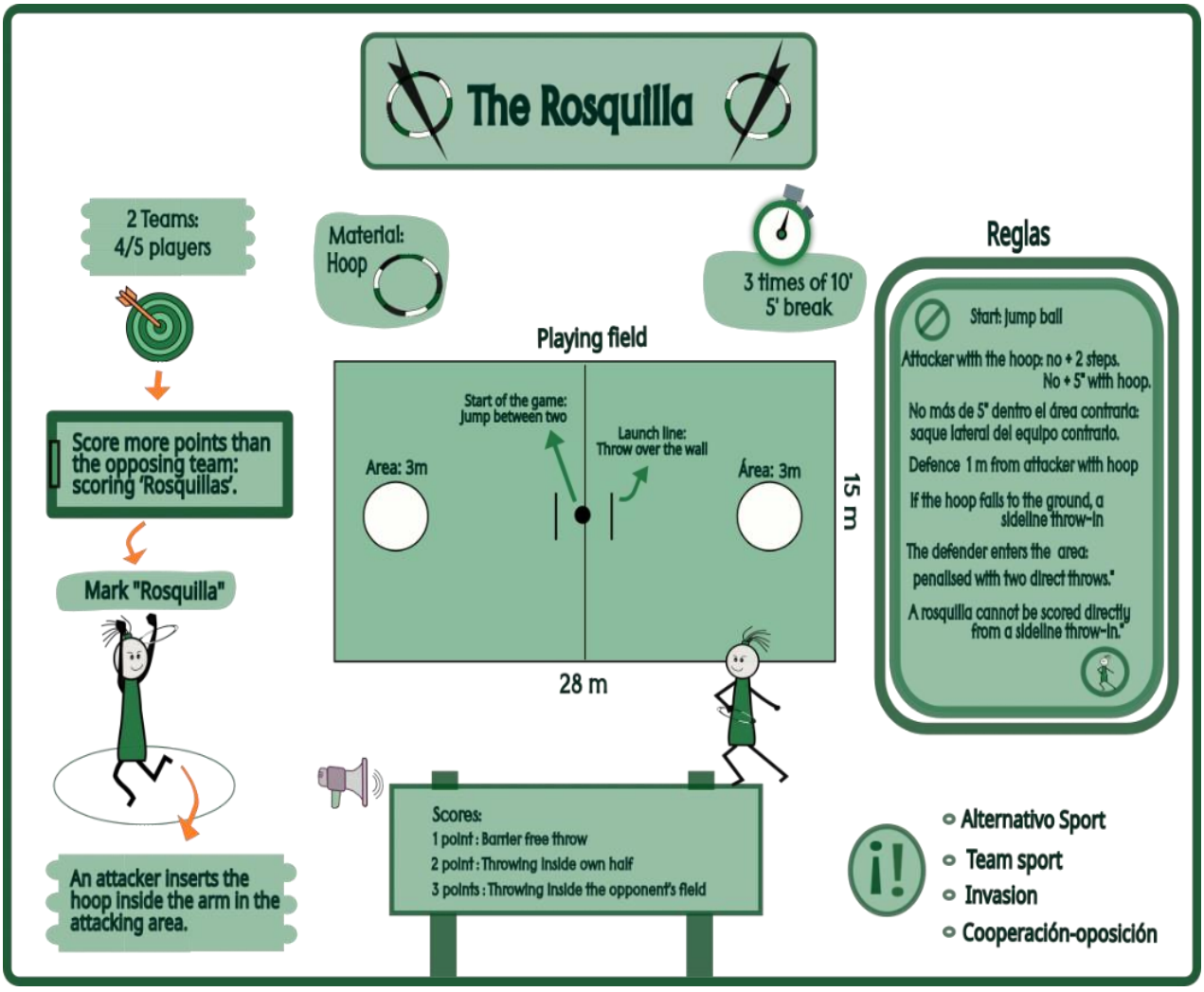
There is a clear relationship between enjoyment and motivation towards physical-sport practice (Bai et al., 2018; Vallerand & Rousseau, 2001). Specifically, a positive correlation has been identified between enjoyment, intrinsic motivation, and identified regulation, while a negative association exists with external regulation and amotivation, often leading to boredom (Michael et al., 2016; Vallerand & Rousseau, 2001). Self-determined motivation promotes enjoyment in physical activity, and in turn, the experience of enjoyment can increase self-determined motivation (Moreno et al., 2008). In this regard, enjoyment stands out as a fundamental reason for engaging in physical-sport practice within the population. When enjoyment is fulfilled, it positively contributes to sports participation (Bai et al., 2018; Burns et al., 2023; González et al., 2019). Given the influence of enjoyment on motivation and sporting involvement, it is advisable to enhance the level of enjoyment in sporting activities to foster greater adherence to practice, thereby generating positive health outcomes and promoting the adoption of active lifestyles (Engels & Freund, 2018; Michael et al., 2016; Moreno et al., 2008). Based on these premises, it is essential to understand which methodological factors influence pupils' enjoyment levels, so that teachers can design programmes that increase learners' sense of enjoyment.

Alternative sports and pedagogical models

Currently, alternative sports (AS) are gaining significant momentum in the field of Physical Education (PE) (Méndez-Giménez, 2023). Their novel, unfamiliar, accessible, and mixed characteristics allow for greater adaptability to the didactic context, promoting access and participation (Calle et al., 2020). This trend supports the holistic development of students (Calle et al., 2023), as it facilitates motor, affective, cognitive, and social development (Calle et al., 2020; Suero et al., 2017). Furthermore, these sports inherently promote values such as participation, fair play,

inclusion, equality, and enjoyment (Calle et al., 2020). Beyond the theoretical context, it is pragmatically important to examine how these types of sports impact enjoyment levels in both girls and boys, assessing whether their mixed-gender features provide equal enjoyment for both sexes. The "Rosquilla" is defined as an alternative invasion sport played on a rectangular pitch featuring two circular zones designated for scoring. The object used is a 28 cm diameter PVC ring. The game involves two teams competing to score more points than the opposing team. Regarding its educational objectives, the sport emphasises equal opportunities for players, co-education through mixed teams, cooperation and teamwork, reduced technical demands, and adaptability (Rodríguez-Barriga, 2023). Figure 1 outlines the key characteristics of the alternative invasion sport known as the "Rosquilla".

Figure 1. Characteristics of the Alternative Sport the "Rosquilla"



Note: Adapted from Calle et al. (2024).

The Game-Centred Model (GCM) focuses on the development of tactical and technical skills through the implementation of a series of practical situations contextualised within the game. This approach facilitates the acquisition of sporting knowledge, competences, and skills from a learner-centred perspective, fostering meaningful learning, greater autonomy, perceived competence, tactical understanding, problem-solving, and decision-making (Harvey & Jarrett, 2014; García-Ceberino et al., 2021). Some of the advantages offered by this model include the development of tactical and motor skills, as well as

improvements in students' motivation and responsibility - factors that enable learners to experience enjoyment during sports practice (Wang & Ha, 2013; Pan et al., 2023).

The Sport Education Model (SEM), developed by Siedentop (Siedentop et al., 2020), has gained wide acceptance and adaptability within the educational context (Wallhead & O'Sullivan, 2005). It is based on competence-based teaching aimed at providing students with an authentic sporting experience through the performance of various roles, responsibilities, and phases (Siedentop et al., 2020). This model is grounded in structural elements of sport that are adapted to the didactic setting, such as seasons, team affiliation, formal competition, performance recording, festivity, and a culminating event (Siedentop et al., 2020). Some of the benefits resulting from its implementation include increased participation, autonomy, responsibility, motivation, and enjoyment among pupils (Hastie et al., 2014; Méndez-Giménez et al., 2022; Perlman, 2012; Núñez et al., 2020).

The hybrid model (HM), which combines the Game Centred Model and the Sport Education Model, has shown improvements in the acquisition of sporting skills, game understanding, and student motivation (Farias et al., 2015; Gil-Arias et al., 2017; González-Víllora et al., 2019). This approach enables learners to apply tactical knowledge and motor skills in a real sporting context within a formal competition setting (Pan et al., 2023). While it is well established that pedagogical models influence pupils' levels of enjoyment, an important question arises: how do pedagogical models affect the degree of enjoyment experienced by students during the learning of alternative sports?

The relationship between the type of game or sport and the emotions generated in pupils is crucial when it comes to guiding the design of Physical Education sessions, in a way that promotes personal and social growth (Lavega-Burgués et al., 2012). The benefits that enjoyment can offer in promoting physical, mental, and social health contribute to achieving a holistic education, one that fosters emotional education - an essential component for today's learners (López-Cassà & Bisquerra-Alzina, 2024).

In this context, the following questions arise: How do the Game Centred Model (GCM) and the Hybrid Model (HM) affect students' enjoyment levels when engaging in alternative sports? Does the level of enjoyment during the learning of an alternative sport differ according to gender? This study aims to assess pupils' enjoyment during the practice of an alternative invasion sport based on the pedagogical model used and the students' gender, as enjoyment is a key factor in promoting physical activity and enhancing pupils' overall wellbeing. The limited scientific evidence regarding the effects of pedagogical models on enjoyment in physical and sporting activities - particularly in relation to alternative sports - provides a strong rationale for this research. Therefore, the main objective was to evaluate how the proposed pedagogical approaches - the Game Centred Model (GCM) and the Hybrid Model (HM), which combines the GCM and the Sport Education Model (SEM) - along with gender, influence pupils' enjoyment during participation in the alternative sport known as the "Rosquilla". The hypotheses were: (1) Students will report increased enjoyment following the intervention programmes; (2) The HM will yield higher enjoyment levels than the GCM; (3) Boys will experience greater enjoyment than girls.

Method

Study Design

A quasi-experimental research design was developed, involving two groups with repeated measures (pre-test/post-test) (O'Donoghue, 2013). Two newly validated intervention programmes were applied (Calle et al., 2024), in which students practised both the alternative sport the "Rosquilla" and the proposed pedagogical models for the first time. Each intervention was implemented over a two-month period.

Participants

Participants were selected through non-probability sampling using a convenience and purposive sampling approach (O'Donoghue, 2013), based on feasibility and accessibility for the researchers. The sample consisted of 136 pupils (74 girls and 62 boys), distributed across six natural groups from Year 1 of lower secondary education (ESO) and Years 5 and 6 of primary education (PE) (M = 11.36; SD = 1.04). These students attended one state secondary school and one state primary school located in the southwest of Spain. Each pedagogical model was randomly assigned to two groups at each educational level. Class groups were not altered, thereby ensuring the ecological validity of the study. The following inclusion criteria were established: (1) signed informed consent from parents/legal guardians; (2) pupils must have attended at least 80% of the sessions; and (3) they must have completed all items in the proposed questionnaires. Table 1 presents the characteristics of the sample in relation to the pedagogical model and educational stage

Table 1. Characteristics of students by pedagogical model and educational stage

Methodology	Education level					
	1st OSE		6th PE		5th PE	
	n	%	n	%	n	%
GCM	29	21.3%	24	17.6%	18	13.2%
MH	27	19.8%	24	17.6%	14	10.3%

Note: n= participants; *%*= percentage of particpants; *GCM*= Game-Centred Model; *HM*= hybrid model of the Game-Centred Model and the Sports Education; *OSE*= Obligatory Secondary Education; *PE*= Primary Education.

Variables and Instruments

Two independent variables were established: (i) the instructional programmes based on the Game Centred Model (GCM) and the Hybrid Model (HM), which combines the Game Centred Model and the Sport Education Model; and (ii) gender (male and female). The dependent variable was sporting enjoyment.

The intervention programmes were similar in terms of content, objectives, phases of play, and types of learning tasks, differing only in the specific features of each pedagogicalmodel (Figure 2). Both programmes were validated by a panel of nine expert judges specialising in invasion sports and teaching models. The evaluation of the learning tasks for each model yielded excellent content validity values (Aiken's V ≥ .73) and internal consistency (Cronbach's α = .99) (Calle et al., 2024). Both teaching models were based on active methodologies. The Hybrid Model (HM) granted pupils greater autonomy during the season, competition, record-keeping, and final event phases.

Figure 2. Structure of the GCM and MH intervention programmes

Programme	Game Centred Model (GCM)	Model of Hibridation of Game Centred Model & Sport Education (MH)
Presentation task	Presentation task	Presentation task and role students
Feedback	Interrogative (students answer questions and make decisions)	Interrogative Interrogative for role students
Teaching task	Reduced games with opponents and modified rules (decision making)	Reduced games (decision making) Role's students: Player, Team and Organizational.
Task direction	Teacher-directed	Teacher and student directed Student autonomy
	Contents	*Observations*
Lesson 1	*Game Phase*: Mixed. *Contents*: knowledge of the Rules. Reduced game and mini-sport.	*GCM*: Teacher-directed. *MH*: Teacher-directed. Role: player. Phase Affiliation.
Lesson 2	*Game Phase*: Mixed. *Contents*: Control of possession/recovery possession.	*GCM*: Teacher-directed. *MH*: Teacher-directed. Role: player. Phase Affiliation.
Lesson 3	*Game Phase*: Mixed. *Contents*: Hoop driving/defence space.	*GCM*: Teacher-directed. *MH*: Teacher-directed. Roles: Player and Team. Phase season.
Lesson 4	*Game Phase*: Mixed. *Contents*: Occupation of space (pass lines/cut passing lines).	*GCM*: Teacher-directed/*MH*: Teacher and student directed. Roles: Player and Team. Phase season.
Lesson 5	*Game Phase*: Mixed. *Contents*: Driving (pass lines) /Driving interruption (Cut passing lines).	*GCM*: Teacher-directed/*MH*: Teacher and student directed. Roles: Player and Team. Phase season.
Lesson 6	*Game Phase*: Mixed. *Contents*: Driving (unmarking/marking).	*GCM*: Teacher-directed/*MH*: Teacher and student directed. Roles: Player, Team and Organizational. Phase season.
Lesson 7	*Game Phase*: Mixed. *Contents*: Driving (unmarking)/ Interruption of driving (marking).	*GCM*: Teacher-directed/*MH*: Student directed. Roles: Player, Team and Organizational. Phase season.
Lesson 8	*Game Phase*: Mixed. *Contents*: progression to make Rosquilla/defence of the area.	*GCM*: Teacher-directed/*MH*: Student directed. Roles: Player, Team and Organizational. Phase season.
Lesson 9	*Game Phase*: Attack. *Contents*: counter-attack.Driving and marking of "Rosquilla" (point).	*GCM*: Teacher-directed/*MH*: Student directed. Roles: Player, Team and Organizational. Phase season.
Lesson 10	*Game Phase*: Mixed. *Contents*: Practice the sport, "Rosquilla".	*GCM*: Teacher-directed/*MH*: Student directed. Roles: Player, Team and Organizational. Championships.
Lesson 11	*Game Phase*: Mixed. *Contents*: Practice the sport, "Rosquilla".	*GCM*: Teacher-directed/*MH*: Student directed. Roles: Player, Team and Organizational. Championships and Assessment students.
Lesson 12	*Game Phase*: Mixed. *Contents*: Practice the sport, "Rosquilla".	*GCM*: Teacher-directed/*MH*: Student directed. Roles: Player, Team and Organizational. Final Championships and Festivity.

Note: Adapted from Calle et al. (2024). HM = Hybrid Model combining the Game Centred Model and the Sport Education Model; GCM = Game Centred Model. Tactical knowledge is similar in both models.

Data were collected before and after the implementation of both programmes using a questionnaire that has been validated and widely accepted by the scientific community. Pupils completed the Physical Activity Enjoyment Scale (PACES), adapted into Spanish and validated by Moreno et al. (2008). This instrument consists of 16 items grouped into two subscales (positive and negative enjoyment), comprising 9 items assessing positive enjoyment and 7 items assessing negative enjoyment. A five-point Likert scale was used, ranging from 1 (strongly disagree) to 5 (strongly agree) (Moreno et al., 2008).

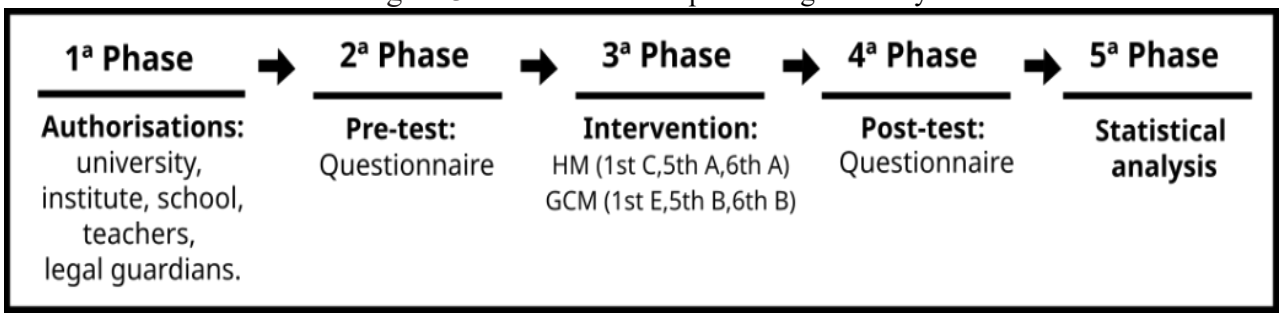
Procedure

Prior to the intervention, the aims and key characteristics of the research were communicated to the school management, the participating teacher, and the pupils' families. Informed consent and the necessary permissions were obtained to carry out the study. All procedures followed the principles of the Declaration of Helsinki (2013), adapted to the context of Social Sciences, with participants' voluntariness and anonymity always respected. Ethical approval was also granted by the Bioethics and Biosafety

Committee of the University of Extremadura (159/2022).

The study was organised into five main phases. First, the required authorisations and permissions were obtained. Subsequently, the pre-test evaluation was conducted. In the third phase, the two learning scenarios were implemented. The intervention lasted approximately two months, consisting of 12 sessions delivered over two practical sessions per week. The programmes were designed and delivered by the lead researchers, who specialise in the application of pedagogical models. In the fourth phase, the post-test evaluation was carried out. Finally, the data collected were entered into a statistical software programme for analysis. Figure 3 presents the procedure followed in this study

Figure 3. Procedure developed during the study



Statistical analysis

The factorial model of the scale used in the study was examined through a confirmatory factor analysis, and internal consistency was assessed using Cronbach's alpha (Field, 2009). Descriptive statistics were calculated using the mean and standard deviation to determine the sport enjoyment scores in the pre-test and post-test for each student. Additionally, the Kolmogorov–Smirnov test indicated that the study variables did not meet the assumption of normality, and therefore non-parametric statistical models were employed (Field, 2009). A Mixed Linear Model (MLM) and Bonferroni post hoc test were performed (Iannaccone et al., 2021) to identify statistically significant differences in the enjoyment variable in relation to the teaching methodology and gender. This model allows for the consideration of individual variability in participants' responses. Group differences based on methodology, gender, and the interaction between these variables were examined using the Bonferroni post hoc multiple comparison test (Field, 2009). Differences were considered statistically significant when $p \leq .05$.

Finally, effect size was computed using partial eta squared (η^2), along with observed power (ϕ). The interpretation of η^2 followed established thresholds: small (0.010–0.059), medium (.060 - .139), and large (>.140). In the case of observed power, values greater than 0.80 were considered optimal (Cárdenas & Arancibia, 2014).

The analyses were conducted using the Statistical Package for the Social Sciences (SPSS), version 25 (IBM Corp., 2012. IBM SPSS Statistics for Windows, NY: IBM Corp., Armonk, USA), and the Jamovi software (version 2.3.24).

Results

The items of the PACES questionnaire were analysed using confirmatory factor analysis. Following an initial analysis, it was necessary to apply index modifications, correlating the following residual covariances: items 9 and 15, and items 4 and 8. The resulting fit indices were deemed acceptable: CMIN/DF = 2.38, CFI = .95; TLI = .95; SRMR = .03, RMSEA = .07 (Hu & Bentler, 1999). The PACES scale (*AIC* = 9096; *BIC* = 9280) showed optimal

reliability for both of its factors: positive enjoyment (α = .91) and negative enjoyment (α = .91) (Field, 2009).

The descriptive results of the variable sport enjoyment for the two instructional programmes and gender are presented in Table 2. This analysis enabled the visualisation of both positive and negative enjoyment levels in relation to the independent variables - pedagogical models and gender - revealing improvements in the degree of enjoyment for both models and across genders.

Table 2. Descriptive results of the sport enjoyment variable according to the pedagogical model and gender

Programme	Variables	Gender	Pre-test *M±DT*	Post-test *M±DT*	Post -Pre
GCM	Positive Enjoyment	Male	3.29 ± .57	4.09 ± .54	0.80
		Female	3.10 ± .71	4.05 ± .64	0.95
		Total	3.19 ± .65	4.07 ± .59	0.88
	Negative Enjoyment	Male	2.43 ± .61	1.70 ± .56	-0.73
		Female	2.64 ± .70	1.72 ± .61	-0.92
		Total	2.54 ± .66	1.71 ± .58	-0.83
Programme	**Variables**	**Gender**	**Pre-test *M±DT***	**Post-test *M±DT***	**Post -Pre**
MH	Positive Enjoyment	Male	3.68 ± .50	4.60 ± .37	0.92
		Female	3.11 ± .57	4.16 ± .51	1.05
		Total	3.35 ± .61	4.34 ± .51	0.99
	Negative Enjoyment	Male	2.05 ± .67	1.28 ± .46	-0.77
		Female	2.50 ± .56	1.39 ± .43	-1.11
		Total	2.32 ± .64	1.34 ± .45	-0.98

Note: Pre= Pre-test; post= Post-test; *M*= Mean; *SD*= Standard deviation; *GCM*= Game-Centred Model; *MH*= Model of Hybridi-zation of the Model of the Game-Centred Model and the Sports Education.

Inferential results for the enjoyment variable across the factors time and pedagogical model are shown in Table 3. This analysis enabled the comparison of enjoyment levels between the two time points (pre-test/post-test), as well as between the two pedagogical models Game-Centred Model (GCM) and Hybrid Model (HM). Statistically significant differences were found in the within-subject factor for both positive enjoyment (F = 1021; p < .001; η^2 = .88) and negative enjoyment (F = 707.29; p < .001; η^2 = .84), indicating substantial improvements in enjoyment following the intervention. Statistically significant differences were also observed in the between-subject factor for positive enjoyment (F = 4.74; p = .03; η^2 = .03) and negative enjoyment (F = 9.5; p = .002; η^2 = .07), suggesting that the type of pedagogical model influenced the level of enjoyment experienced by students. Moreover, significant interaction effects were identified for the time × pedagogical model factor, both in positive enjoyment (F = 3.98; p = .04; η^2 = .03) and negative enjoyment (F = 4.96; p = .02; η^2 = .04), indicating that the impact of the intervention differed according to the pedagogical model implemented. Specifically, the Hybrid Model (HM) led to higher increases in positive enjoyment and greater reductions in negative enjoyment, compared to the Game-Centred Model (GCM).

Table 3. Results of the repeated measures Mixed Lineal Model (MLM) for the enjoyment variable across moment and pedagogical model factors

	Variables	*F*	*p*	*η2*	*ϕ*	Post hoc
Intra-subject	Positive Enjoyment	1021.00	< .001*	.88	1.00	a
Moment	Negative Enjoyment	707.29	< .001*	.84	1.00	a
(pre-post)						
Inter-subject	Positive Enjoyment	4.74	.03*	.03	.58	b
Model	Negative Enjoyment	9.50	.002*	.07	.86	b
(MH and GCM)						
Moment x model	Positive Enjoyment	3.98	.04*	.03	.51	c, d, e, f, g
interaction	Negative Enjoyment	4.96	.02*	.04	.60	c, d, e, f, g.

Note: GCM= Game-Centred Model; *MH*= Model of Hybridization of the Game-Centred Model and the Sports Education; *Pre*= Pre-test; *post*= Post-test; *a*= Pre-Post; *b*= GCM-MH; *c*= Post GCM-Post MH; *d*= Post GCM-Pre MH; *e*= Pre GCM-Post MCJ; *f*= Pre GCM-Post MH; *g*= Pre MH-Post MH; *F*= statistical F, *η2*= effect size; *ϕ*= observed power; *p** < .05.

Table 4 presents the results of the random effects control for each group within the moment and pedagogical model factors. The findings revealed improvements in the Conditional R^2 compared to the Marginal R^2 for both variables, accounting for the random effect of individual participant responses. Moreover, all variables showed statistical significance, indicating the necessity of controlling for inter-subject variability. A high Intraclass Correlation Coefficient (*ICC* > .5) was observed, suggesting that pupil individuality had a substantial impact on the outcomes obtained.

Table 4. Control of the MLM random effect of the moment and model factors

Variables	Marginal R^2	Conditional R^2	*AIC*	*p*	*ICC*
Positive Enjoyment	.397	.900	505	< .001*	.83
Negative Enjoyment	.393	.864	504	< .001*	.78

Note: AIC=Akaike Information Criterion; *ICC*=Interclass Correlation Coefficient; p* < .05.

The inferential results for the variable enjoyment, considering the factors moment and gender, are presented in Table 5. This analysis compared enjoyment levels in relation to the intervention moments (pre-test/post-test) as well as to gender (M/F). Statistically significant differences were found for the within-subject factor in both positive enjoyment (F=1015.64; p<.001; η^2=.88) and negative enjoyment (F=738.22; p<.001; η^2=.85). Regarding the between-subject factor, significant differences were observed in positive enjoyment (F=8.46; p=.004; η^2=.06). Additionally, significant interaction effects were found between moment × gender for both positive enjoyment (F=6.85; p=.01; η^2=.05) and negative enjoyment (F=16.93; p<.001; η^2=.11). The results revealed improvements in enjoyment levels over the course of the intervention. Furthermore, boys reported significantly higher levels of positive enjoyment compared to girls.

Tabla 5. Resultados del MLM de medidas repetidas de la variable disfrute de los factores momento y género

	Variables	*F*	*p*	*η2*	*ϕ*	Post hoc
Intra-Subject Moment (pre-post)	Positive Enjoyment	1015.64	< .001*	.88	1.00	a
	Negative Enjoyment	738.22	< .001*	.85	1.00	a
Inter-Subject Gender (M and F)	Positive Enjoyment	8.46	.004*	.06	.823	b
	Negative Enjoyment	3.02	.08	.02	.407	-
Moment x model interaction	Positive Enjoyment	6.85	.01*	.05	.739	c, d, e, f, g.
	Negative Enjoyment	16.93	< .001*	.11	.983	c, d, e, f, g.

Note: M= male; F= female; Pre= Pre-test; post= Post-test; a= Pre-Post; b= Male-Female; c= Post male-Pre female; d= Pre female-Post female MH; e= Pre male-Post female; f= Pre male-Post male; g= Pre male-Pre male; F= statistical F, η2= effect size; ϕ= observed power; p* < .05.

Table 6 presents the results of the random effects control for each group within the moment and gender factors. The findings showed improvements in the Conditional R^2 compared to the Marginal R^2 for both variables, indicating the control of the random effect related to individual participant responses. Moreover, all variables reached statistical significance, highlighting the necessity of accounting for inter-subject variability. A high Intraclass Correlation Coefficient (*ICC* > .5) was obtained, which demonstrates that individual differences among pupils substantially influenced the outcomes.

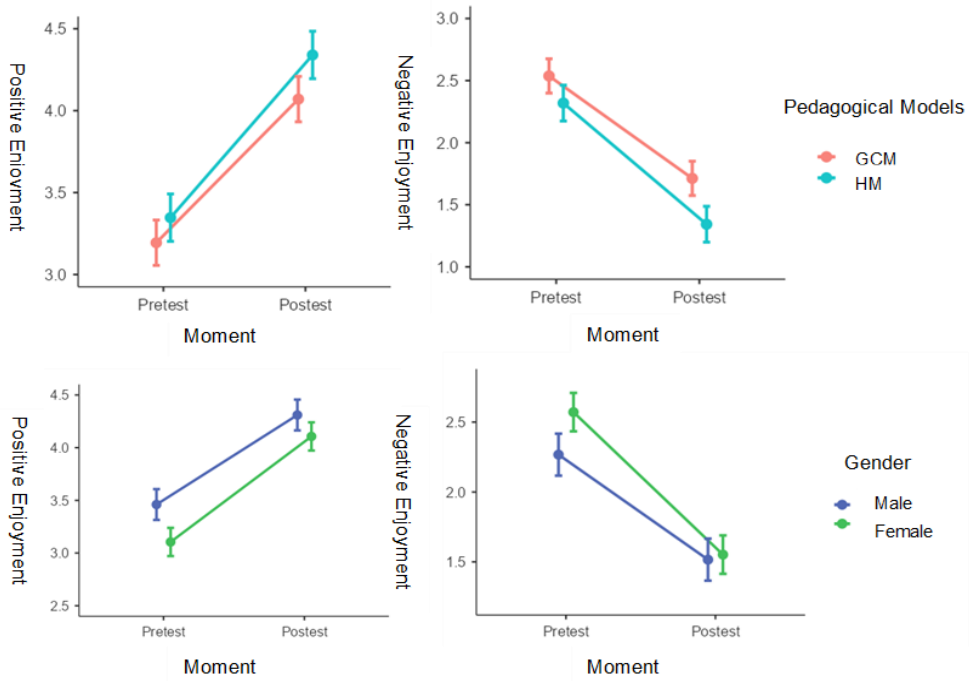
Table 6. Control of the MLM random effect of the moment and gender factors

Variables	R^2 Marginal	R^2 Conditional	*AIC*	*p*	*ICC*
Positive Enjoyment	.413	.902	498	< .001*	.833
Negative Enjoyment	.373	.875	513	< .001*	.800

Note: AIC=Akaike Information Criterion; ICC=Interclass Correlation Coefficient; p* < .05.

Figure 4 presents the results obtained from the repeated measures Linear Mixed Model (LMM), illustrating the relationship between the enjoyment variable (positive and negative) and the moment factor in conjunction with the pedagogical model implemented and gender

Figure 4. Relationship between enjoyment (positive and negative) and moment (pre-test and post-test) according to pedagogical model and gender



Discussion

The aim of the study was to assess whether pedagogical models and gender influence sport-related enjoyment in the learning of the alternative sport the "Rosquilla". The results indicate improvements in enjoyment in relation to both pedagogical models and gender; that is, higher enjoyment levels were reported in the post-test compared to the pre-test. Therefore, Hypothesis 1 is supported, as pupils reported significantly higher levels of positive enjoyment and lower levels of negative enjoyment following the implementation of the programmes. Moreover, students who engaged with the Hybrid Model (HM) achieved significantly higher scores in positive enjoyment and lower scores in negative enjoyment compared to those in the Game-Centred Model (GCM), thereby supporting Hypothesis 2. Lastly, significant differences were observed in positive enjoyment according to gender (boys > girls), partially supporting Hypothesis 3.

Participants achieved higher levels of positive sport enjoyment and lower levels of negative enjoyment with both pedagogical models. These findings are consistent with previous research indicating that the Game-Centred Model (GCM) fosters improvements in students' motivation and responsibility—factors that contribute to their experience of enjoyment during physical practice (Wang & Ha, 2013; Pan et al., 2023). The application of the Sport Education Model (SEM) has been shown to enhance student participation, autonomy, responsibility, motivation, and enjoyment (Hastie et al., 2014; Méndez-Giménez et al., 2022; Perlman, 2012). There is also scientific evidence supporting the positive effects of SEM on sport enjoyment (Cuevas et al., 2016; Gil-Arias et al., 2018; Meroño et al., 2015). The Hybrid Model (HM) leads to improvements in sport-specific skills, game understanding, and student motivation (Farias et al., 2015; Gil-Arias et al., 2017; González-Víllora et al., 2019; Neves et al., 2025), offering pupils the opportunity to apply tactical and motor skills within a realistic sporting context, which in turn enhances their enjoyment of physical activity (Pan et al., 2023). The present study confirms that both methodologies, when applied to an alternative sport previously unknown to students, contribute to fostering sport enjoyment during practice.

Enjoyment is one of the key determinants of sustained participation in physical and sport-related activities (Bai et al., 2018; Burns et al., 2023; Castillo & Balaguer, 2001), as its fulfilment positively contributes to sport engagement (Bai et al., 2018; Burns et al., 2023; González et al., 2019), leading to greater adherence to physical exercise (Engels & Freund, 2018; Michael et al., 2016; Moreno et al., 2008). Conversely, the absence of enjoyment—referred to as negative enjoyment—is considered a primary reason for sport dropout (Bai et al., 2015, 2018; Cervelló, 2002). Therefore, both pedagogical models contribute to improvements in sport enjoyment, which in turn promotes greater participation, self-determined motivation, and adherence to sport practice, with the potential to generate positive health outcomes and the adoption of active lifestyles. It is essential to consider levels of enjoyment and emotional experiences when planning Physical Education sessions, as these elements support the personal and social development of pupils (Lavega-Burgués et al., 2012), enhancing a more holistic and emotionally oriented education—key aspects for today's learners (López-Cassà & Bisquerra-Alzina, 2024).

The hybrid model (MH) yielded higher scores in positive enjoyment and lower scores in negative enjoyment compared to the model centred on the game (MCJ). These findings are consistent with previous research demonstrating that MH has a more beneficial impact on motivation, responsibility, sport enjoyment, and game performance than MCJ in invasion games (Pan et al., 2023). The characteristics of the Sport Education Model (SEM) foster greater autonomy and responsibility among pupils, aspects that contribute to enhanced enjoyment during physical education sessions (Cuevas et al., 2016; Gil-Arias et al., 2018; Méndez-Giménez et al., 2022). Perlman (2012) also reported that SEM positively influences students' sense of pleasure. Furthermore, the MH provides students with the opportunity to apply learned tactical and motor skills in authentic game situations within a real competitive context, thereby promoting motivation and enjoyment throughout the practice (Pan et al., 2023). According to Garn and Cothran (2006), several sources contribute to the experience of positive enjoyment, including social bonding, mastery experiences, kinaesthetic sensations, and both intrinsic and extrinsic achievement factors. As highlighted by Hastie et al. (2011), SEM creates a learning environment where students derive greater enjoyment from participation, gameplay, and peer interaction. Consequently, the MH facilitates a more enjoyable sport experience for pupils. Notably, the MH appears to offer a greater potential for pupils to experience enjoyment in the practice of an alternative sport previously unknown to them—namely, the "Rosquilla". Enjoyment is a critical factor in continued engagement in physical and sport-related activities (Castillo & Balaguer, 2001). When enjoyment is positive, it enhances sport participation and fosters long-term adherence to physical exercise (Engels & Freund, 2018; Michael et al., 2016; Moreno et al., 2008).

The findings reveal greater positive enjoyment and lower negative enjoyment with respect to gender. Significant differences emerged solely in positive enjoyment between genders, with boys scoring higher than girls, while no significant gender-based differences were observed for negative enjoyment. Traditionally, there has been a tendency towards unequal and stereotypical participation within invasion sports (Gutiérrez & García-López, 2012). Generally, boys tend to be more physically active and report higher enjoyment in Physical Education (PE) compared to girls (Johnson et al., 2017; Lluna-Ruiz et al., 2020). Boys are typically more associated with team sports; however, an increasing number of girls are demonstrating both knowledge of and interest in these sports (Altmann et al., 2011). Moreover, some studies suggest that team sports are linked to enjoyment-driven participation in both boys and girls (Michael et al., 2016). In the present study, the alternative sport employed—characterised by its novelty, unfamiliarity, playful nature, and coeducational format (Calle et al., 2020; Martos-García et al., 2020)—was designed to foster equal access and participation, thereby promoting a comparable level of enjoyment across genders.

This aim was achieved for negative enjoyment, where no gender differences were noted. However, disparities emerged in terms of positive enjoyment, with boys reporting significantly higher levels than girls. These findings are consistent with those reported by Aznar-Ballesta and Vernetta-Santana (2023), who found that adolescent boys experience greater enjoyment than girls in sports such as basketball, handball, football, volleyball, and karate. Despite efforts to construct a coeducational and equitable sporting context, boys continued to report higher levels of positive enjoyment. This suggests the need for further research exploring gender-based differences in enjoyment levels to identify and establish conditions that enable both boys and girls to experience similar levels of enjoyment in physical activity settings.

Conclusions

The implementation of teaching programmes grounded in both methodological approaches (GCM and MH) establish an educational context that fosters greater positive enjoyment and reduced negative enjoyment (boredom) among students during the practice of the alternative sport the "Rosquilla". Consequently, both pedagogical models lead to improvements in students' sport enjoyment, a factor that promotes sport participation, self-determined motivation, and adherence to physical activity, which may ultimately contribute to positive health outcomes and the adoption of an active lifestyle. The findings suggest that the MH approach has a greater potential to enhance students' enjoyment during sports practice, making it a more advisable option within educational settings.

Similarly, both boys and girls reported higher levels of positive enjoyment and lower levels of negative enjoyment (boredom). The characteristics of alternative sports provide a mixed and equitable context. However, boys exhibited a significantly higher level of positive enjoyment compared to girls. Therefore, educators should plan and intervene with increased emphasis on coeducation and equity, to create a learning environment in which both genders experience an equal degree of pleasure and positive enjoyment.

Practical application

This study provides relevant insights to support the work of Physical Education teachers, as the use of the proposed pedagogical models—particularly the Hybrid Model (HM)—facilitates students' experience of pleasure and enjoyment during sport learning, thereby fostering greater motivation and engagement in physical activity. It is essential to establish a learning environment that promotes enjoyment to achieve stronger adherence to sport participation, leading to positive outcomes for health and the adoption of active lifestyles. This highlights the importance of careful planning in the educational process. Therefore, the implementation of the alternative sport the "Rosquilla" through these methodological approaches contributes to enhancing both the quality of the educational system and the health dimension of students. Moreover, the HM promotes higher levels of positive enjoyment and lower levels of negative enjoyment (boredom), making it more suitable for application in school settings.

Limitations and future lines of research

The sample size constitutes a limitation in terms of the generalisability of the results obtained. Therefore, further research is needed to examine enjoyment within the school context, incorporating a larger number of participants. Likewise, there is an additional challenge insofar as, within the educational field, each intervention and group is subject to the specific characteristics of the particular school context, its students, and the teacher, thereby creating unique and non-replicable conditions. In this regard, it is important to highlight those specific features of the intervention—such as the type of sport, educational stage, student characteristics, teacher role, and school context—significantly influence the outcomes, as well as the variability in students' responses. Although the findings may not be generalisable, similar results may be observed in sports with the same internal logic, methodological approach, and educational level, provided that comparable conditions are recreated.

In future research, it would be advisable to analyse the level of enjoyment among a larger number of students from both primary and secondary schools located in various geographical areas. This would allow for a substantial increase in the sample size and help determine whether the variables under study are influenced by the geographical context. Moreover, this study examined only one alternative sport; therefore, future research should aim to analyse students' enjoyment with other alternative sports using the same methodological design. Additionally, it would be pertinent to compare students' levels of enjoyment during the practice of alternative sports with their enjoyment when engaging in traditional sports, employing the same pedagogical approach.

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