Sportis
Revista Técnico-Científica del Deporte Escolar, Educación Física y Psicomotricidad
Scientific Technical Journal of School Sport, Physical Education and Psychomotricity

Editor: University of A Coruña. A Coruña. Spain
ISSN-e 2386-8333
E-mail: sportis.journal@udc.es Web: https://revistas.udc.es

Original article. Does Bigflayerball develop the motor and social skills of Secondary Education students?
Vol. 11, n.º 2; p. 1-27, April 2025. https://doi.org/10.17979/sportis.2025.11.2.11316

Does Bigflayerball develop the motor and social skills of secondary education students?

¿El Bigflayerball desarrolla las habilidades motrices y sociales del alumnado de Educación Secundaria?

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Editorial Schedule: *Article received 10/16/2024 Accepted: 03/07/2024 Published: 04/01/2025*
https://doi.org/10.17979/sportis.2025.11.2.11316

To cite this article use the following reference:
Sánchez-Pérez, A.; Aparicio-Espejo, R.; Ramírez-Lechuga, J.; Cenizo-Benjumea, J.M. (2025). Does Bigflayerball develop the motor and social skills of Secondary Education students? *Sportis Sci J*, 11 (2), 1-27 https://doi.org/10.17979/sportis.2025.11.2.11316

Author contribution: All authors contributed equally to the work.

Funding: The study did not obtain funding.

Conflict of interest: The authors declare that they have no conflict of any kind

Ethical aspects: The study declares the ethical aspects.

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Abstract
Currently there is a deficit of alternative divided court sports that favor the development of social skills and motor skills in students. The objective of the present study was to analyze the results of a learning situation about a novel alternative sport called BigFlayerBall. The research was carried out during nine sessions with a group of 25 students (15 boys and 10 girls) from the first year of Secondary School. Regarding the methodology, a hybridization of three pedagogical models was used (Teaching Games for Understanding, Sports Education Model and Formative and Shared Assessment). The analysis of results showed that all students exceeded the evaluation criteria associated with the learning situation. Furthermore, no significant differences were observed in the results regarding sex. In conclusion, the current learning situation contributes to the acquisition of the specific competencies of the subject of Physical Education, developing the student's social and motor skills.

Key words: active learning, inclusive education, pedagogical model, physical education, sport.

Resumen
En la actualidad existe un déficit de deportes alternativos de cancha dividida que favorezcan el desarrollo de las habilidades sociales y la motricidad en el alumnado. El objetivo del presente estudio fue analizar los resultados de una situación de aprendizaje sobre un deporte alternativo novedoso denominado BigFlayerBall. La investigación se llevó a cabo durante nueve sesiones con un grupo de 25 estudiantes (15 niños y 10 niñas) del primer curso de Educación Secundaria Obligatoria. Respecto a la metodología, se utilizó una hibridación de tres modelos pedagógicos (Enseñanza Comprensiva, Modelo de Educación Deportiva y Evaluación Formativa y Compartida). El análisis de resultados mostró que todo el alumnado superó los criterios de evaluación asociados a la situación de aprendizaje. Además, no se observaron diferencias significativas en los resultados respecto al sexo. En conclusión, la presente situación de aprendizaje contribuye a la adquisición de las competencias específicas de la materia de Educación Física desarrollando las habilidades sociales y motrices del alumnado.

Palabras clave: aprendizaje activo, deporte, educación física, inclusión, modelo pedagógico.

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Introduction

The use of conventional sports and a performance-centered methodology in Physical Education (PE) classes may lead to student demotivation (Caldevilla & Zapatero, 2022) and a decrease in sports participation (Aznar-Ballesta & Vernetta, 2023), especially among girls, due to stereotypes associated with these types of sports (Villora et al., 2008). To encourage sports participation among students, it is essential to help them feel competent (Serra et al., 2020) and create positive interactions to develop both social and motor skills (Palau-Pamies et al., 2022).

Divided-court sports, such as badminton and volleyball, while promoting teamwork, pose significant challenges for students with lower motor competence, often leading to frustration and fear (Canales & Pina, 2014). On the other hand, alternative sports can help replace traditional sports by increasing the participation of less skilled or unmotivated students (Robles & Robles, 2021). However, although these sports encourage cooperation, they do not necessarily ensure equitable participation or significantly stimulate motor engagement (Martínez, 2018).

In this regard, alternative opponent-based sports can be a valuable option compared to conventional sports to promote sports participation (González-Coto et al., 2023). However, they require specific motor skills, such as implement control or ball speed, which may limit the inclusion of all students regardless of their motor abilities. This highlights the need to develop alternative sports that not only foster active participation and the development of motor and social skills in an accessible and motivating environment (Calderón & Ayuso, 2022) but also enhance motor engagement for all participants (Mujica & Jiménez, 2021).

The objective of PE is to improve students' motor coordination from an inclusive perspective, and alternative divided-court sports are ideal for this purpose. These sports require precise movements and strategic decision-making, promoting both motor and cognitive skills.

The development of social skills in PE classes is just as important as the development of motor skills (Navarro et al., 2018). Participation in physical, cooperative, and team activities enhances communication and teamwork (Fernández-Río, 2017; Jiménez & González-Palomares, 2023). The PE curriculum emphasizes the

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importance of these skills by incorporating activities that promote cooperation and respect (López, 2021). In this context, alternative divided-court sports are ideal as they require high interaction and coordination among players. Specifically, the alternative sport known as Bigflayerball (BFB) can be a useful tool for developing both motor and social skills in students.

This sport was created by physical activity and sports specialists José Manuel Cenizo Benjumea and Daniel Avilés Castillo at the Miguel Rueda Infant and Primary Education School in Paradas (Seville). It is a divided-court, cooperation-opposition sport in which four players participate: two in the front zone and two in the back zone. This positioning ensures an equitable distribution of roles and inclusive participation. The ball used, called the Big Ball, has a diameter of 53 cm and is bright pink, facilitating visual perception and reception. The pink color enhances visibility, and the ball's size provides an ideal balance for handling. Players must throw the ball to the opponent's court after passing it among themselves one or two times, ensuring that the ball moves through both play zones (front and back). They can pass the ball to a teammate or throw it to the opposing field using one or both hands or by striking it with their foot. The ball must always be received with both hands. A point is scored when the ball touches the ground in the opponent's field.

Regarding the methodology used in PE classes, the Sport Education Model (SEM) (Siedentop, 1994) has been shown to enhance interest in sports practice (Morales-Ortiz et al., 2021), participation (Smith, 2021), specific motor skills (Hastie et al., 2009), and passion for sports (Martínez, 2013). Additionally, various studies have reported improvements in sportsmanship and friendship (Méndez et al., 2015), engagement and effort (Segovía & Gutiérrez, 2020), basic psychological needs (Cuevas et al., 2015), and connections with extracurricular sports (Burgueño et al., 2020; Molina et al., 2020). On the other hand, the Teaching Games for Understanding model (TGfU) (Bunker & Thorpe, 1986) focuses on tactical needs, using modified games to encourage decision-making (Menezes-Fagundes et al., 2024). This methodology has shown improvements in the organic dimension (skill execution) and the affective dimension of sports practice (Rodríguez et al., 2016). Several researchers recommend combining these PE pedagogical models to avoid the shortcomings of each model when used in

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isolation (Shen & Shao, 2022). Furthermore, the combination of these pedagogies has been proven to enhance students' motor, social, emotional, and cognitive skills (García-González et al., 2020; Gil-Arias et al., 2020; Gil-Arias, Diloy-Peña et al., 2021; Gil-Arias, Harvey et al., 2021; González-Fernández et al., 2023).

The assessment of instructional units should not be limited to a summative and grading process but should be continuous, formative, and integrative (López et al., 2020), focusing on student progress and identifying difficulties. Therefore, it is crucial for students to actively participate in this process (Pérez-Pueyo et al., 2021), engaging in proposed activities, reflecting on the knowledge acquired, and taking action to address emerging challenges. This involves the use of a Formative and Shared Assessment model (FSA), where self-assessment and peer assessment play a crucial role (Herrero-González et al., 2020). Pérez-Pueyo et al. (2020) emphasize the importance of linking educational models with formative assessment to enhance their effectiveness in cooperative learning contexts. The FSA model enhances students' ability to evaluate their achievements concerning a given task (Pérez-Pueyo et al., 2021) and fosters interaction among group members to improve the final outcome of a learning situation (Archilla Prat & Pérez Brunicardi, 2017). This type of assessment must be adapted to the context, students, and content being developed, and its implementation through specific instruments aims to clearly identify the levels of achievement that students can or should attain (Pérez-Pueyo et al., 2021).

These premises align with Article 15 of Royal Decree 217/2022, of March 29, which establishes the organization and minimum teachings of Compulsory Secondary Education (hereinafter Royal Decree 217/2022). This article states that the evaluation of the learning process must be continuous, formative, and integrative.

Given the need to find resources that improve students' motor and social skills in PE classes and the lack of scientific literature on this topic, the objective of this study is to describe a learning situation involving the alternative sport Bigflayerball in the first year of Compulsory Secondary Education. This learning experience is developed through a hybridization of pedagogical models (SEM, TGfU, and FSA) and aims to analyze its effects on students' social and motor skills.

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Material and Method

Design and Procedure

The design used in this research was a quasi-experimental type with a group from a Secondary Education School. The study was conducted during April and May, with the participation of 25 students (15 boys and 10 girls; age: 12±0.4 years). The selection of participating students was carried out through intentional non-probabilistic sampling (due to the accessibility of the sample for conducting the innovation work) (Bisquerra, 2012). The study was approved by the School Council of the Secondary Education School. Its development followed the Helsinki recommendations for research involving human subjects. The legal guardians of the students were thoroughly informed, in writing, about the characteristics and procedures of the study by the researchers and provided written informed consent. Both the students and the teacher had prior experience with the pedagogical models used. However, the students had never practiced the sport modality of Bigflayerball before. The teacher who implemented the learning situation (age: 50 years) has extensive teaching experience (20 years) and is one of the researchers of this innovation project.

Didactic Proposal

Contextualization

The learning situation (LS) titled *"Bigflayerball: New Sports Frontiers"* was implemented in a first-year Secondary Education group at a public school in the province of Seville. The proposal was carried out during the second trimester within the scheduled PE classes, using a total of 9 sessions. During its implementation, no student exhibited serious behavior problems.

Justification

This LS aligns with one of the pedagogical principles established in Article 6 of Royal Decree 2017/2022, which states that "schools will develop their pedagogical proposals for all students at this stage, considering their diversity. Likewise, they will establish methods that take into account the different learning paces of students, encourage independent learning, and promote teamwork." Furthermore, this LS

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contributes to students achieving the stage objectives (Article 7 of Royal Decree 2017/2022), specifically objective *k* (To know and accept the functioning of one's own body and that of others, respect differences, reinforce habits of body care and health, and incorporate physical education and sports practice to promote personal and social development. To understand and value the human dimension of sexuality in all its diversity. To critically assess social habits related to health, consumption, care, empathy, and respect for living beings, especially animals, and the environment, contributing to its preservation and improvement).

Curricular Specification

The curricular elements developed in this LS adhere to Royal Decree 217/2022 and the Order of May 30, 2023, which establishes the curriculum for the Secondary Education stage in the Autonomous Community of Andalusia. This regulation also defines aspects of attention to diversity and individual differences, the evaluation process of student learning, and the transition process between different educational stages (hereinafter Order of May 30, 2023) (Table No. 1).

Methodology

During the development of the LS, a hybridization of three pedagogical models was used: 1) TGfU, focused on understanding tactical aspects through the use of small-sided games (Menezes-Fagundes et al., 2024); 2) SEM, structuring the sessions into three stages (preseason, season, and final phase); and 3) FSA, aimed at promoting formative assessment to identify student difficulties, providing continuous feedback, and encouraging the improvement of their performance throughout the learning process.

Through this methodology, the goal was to develop students' motor and social skills. However, it is important to consider that SEM presents limitations when applied in a reduced number of sessions. Additionally, work was carried out using teams of five members, ensuring heterogeneity in terms of gender, motor competence, and problem-solving abilities.

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Didactic Resources

This LS was conducted in the school's sports court. The materials used included giant pink balls (53 cm in diameter), cones, and adhesive tape to mark the court dimensions and net. Additionally, various didactic resources were used, such as an infographic on Bigflayerball rules, a team worksheet, and secret cards that could be used during matches (Figure No. 1).

Table No. 1. Curriculum elements that contribute to acquiring and developing the learning situation according to Annex II of the Order of May 30, 2023.

STAGE OBJECTIVES:	
k) To know and accept the functioning of one's own body and that of others, respect differences, strengthen habits of care and bodily health, and incorporate physical education and sports practice to promote personal and social development.	
SPECIFIC COMPETENCE:	
2. To adapt, with increasing autonomy in execution, physical, perceptual-motor, and coordination abilities, as well as motor skills and dexterities, by applying perception, decision, and execution processes appropriate to the internal logic and objectives of different situations with variable difficulty, in order to solve motor-related situations linked to various functional, sports, expressive, and recreational physical activities, and to consolidate attitudes of self-improvement, growth, and resilience when facing physical challenges.	
EXIT PROFILE DESCRIPTORS: CPSAA4, CPSAA5, CE2, CE3.	
EVALUATION CRITERIA:	**CORE KNOWLEDGE:**
2.1. Participate in the process of creating motor projects of an individual, cooperative, or collaborative nature, establishing mechanisms to redirect work processes, using self-assessment and peer-assessment strategies with guidance, and initiating attitudes of self-improvement, growth, and resilience.	EFI.1.A.3.1. Acceptance of limitations and possibilities for improvement in motor situations. EFI.1.A.3.2. Physical activity as a source of enjoyment, stress relief, social cohesion, and personal improvement. EFI.1.B.3. Planning and self-regulation of motor projects: establishing self-assessment mechanisms to redirect work processes.
2.2. Act correctly with an acceptable interpretation in varied motor contexts, applying basic decision-making principles in playful situations, modified games, and sports activities with guidance, based on anticipation, adapting to motor demands, to the actions of teammates and opponents (if any), and to the internal logic in facilitated, real, or simulated performance contexts, reflecting on the results obtained.	EFI.1.C.2. Body schema: integration of different coordination, spatial, and temporal aspects in specific motor and/or sports sequences. EFI.1.C.4. Specific motor skills associated with technique in physical-sports activities. EFI.1.C.8. Adaptation of one's own actions to basic attack and defense strategies in different motor situations in collaboration-opposition sports, with and without interaction with a ball.

CC, Civic competence; CCEC, Competence in cultural awareness and expressions; CD, Digital competence; CE, Entrepreneurial competence; CPSAA, Personal, social, and learning-to-learn competence; EF, Physical Education.

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Pedagogical Principles

This LS has been designed in accordance with the pedagogical principles outlined in Article 6 of Royal Decree 217/2022. Specifically, this instructional unit has been developed with attention to diversity, considering the different learning paces of students, fostering their ability to learn autonomously, and promoting teamwork. Additionally, this innovative alternative sport encourages collaborative problem-solving, reinforcing self-esteem, autonomy, reflection, and responsibility. Moreover, transversally, it integrates emotional and values education, gender equality, creativity, mutual respect, and peer cooperation.

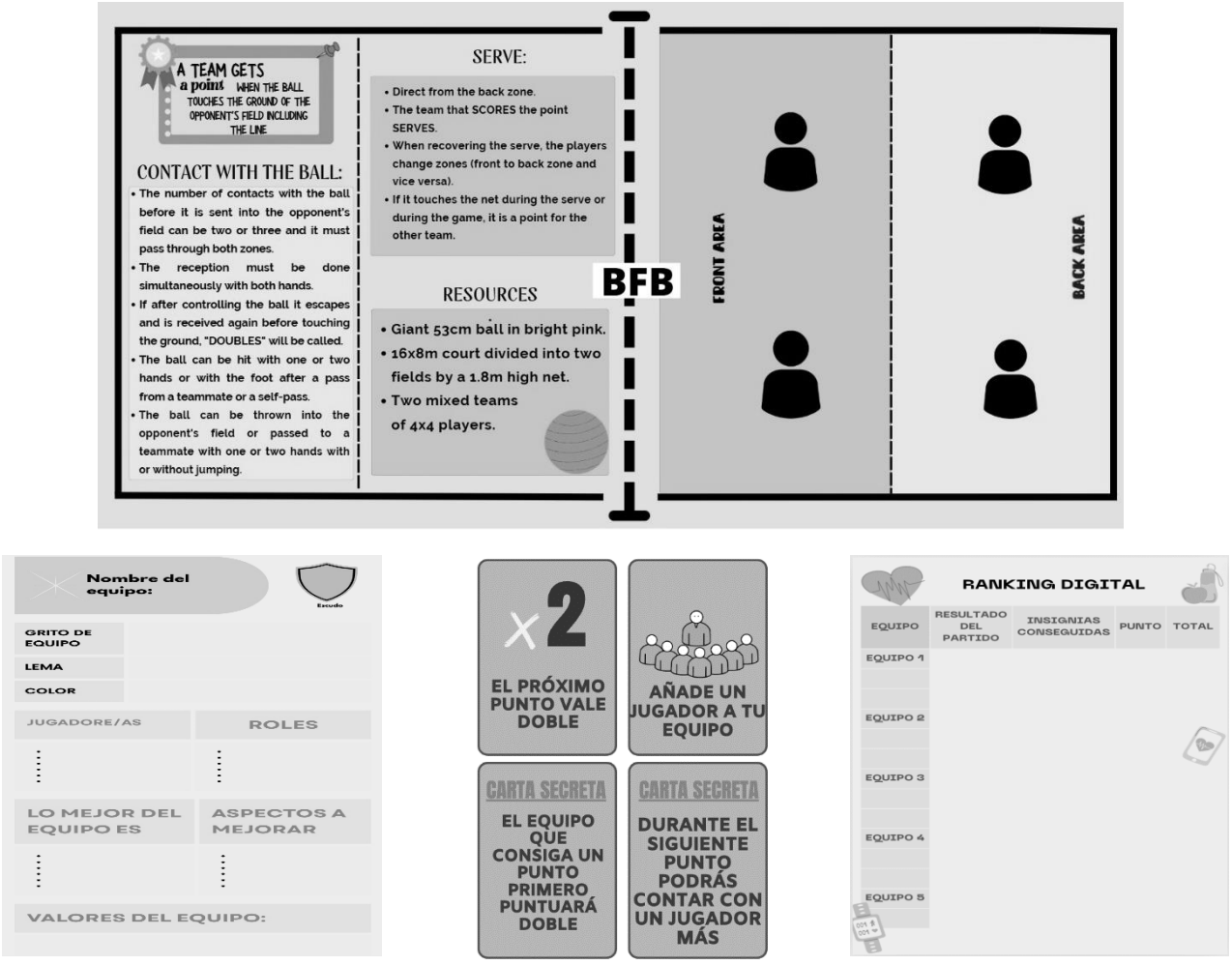

Figure No. 1. Teaching resources used during the development of the learning situation.

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Interdisciplinarity

The preamble of the PE subject in RD 217/2022 recommends the development of different learning situations that incorporate movement as a resource, as well as interdisciplinary approaches and projects whenever possible. This LS could be designed in conjunction with other subjects, such as Visual and Audiovisual Arts, by creating the teaching resources used; Technology and Digitalization, by designing the digital ranking of match results; Spanish Language and Literature, by debating results or technical-tactical aspects of the alternative sport; and Mathematics, by statistically analyzing match records.

Measures for Diversity and Individual Differences

Art. 21.1 of D. 102/2023 (May 9), which establishes the organization and curriculum of Secondary Education in Andalusia (hereafter D. 102/2023), defines attention to diversity and individual differences as the set of educational actions and measures that ensure the best response to the needs and differences of all students in an inclusive environment, offering real learning opportunities in regular educational settings. These measures are regulated in Arts. 21 and 22 of D. 102/2023 and specified in Chapter IV of the O. of May 30. Organizational, methodological, and curricular measures will follow the Universal Design for Learning (UDL) principles, ensuring information is presented in formats suited to student characteristics, providing multiple means of action and expression based on their comprehension and expression abilities, and ensuring motivation for engagement and mutual cooperation (Art. 30, O. of May 30, 2023). The principles and guidelines of UDL were consistently applied throughout the LS.

Assessment

Art. 15 of RD 217/2022 states that assessment in Secondary Education must be continuous, formative, and integrative. Specifically, Art. 10.1 of the O. of May 30, 2023, establishes that student learning assessment must be continuous, competence-based, formative, integrative, differentiated, and objective according to the various

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subjects in the curriculum, serving as a tool to improve both teaching and learning processes.

Regarding procedures and assessment tools, Art. 11 of the Order of May 30, 2023, specifies that teachers should conduct assessment primarily through continuous observation of student learning progress in relation to assessment criteria and the level of development of each subject's specific competencies. Since assessment criteria must be measurable, objective observation mechanisms should be established. Various assessment instruments will be used, including questionnaires, forms, presentations, oral expositions, document editing, tests, observation scales, rubrics, and portfolios, ensuring consistency with the assessment criteria and student characteristics. This guarantees that assessment aligns with the principle of diversity and individual differences. Peer and self-assessment processes will be encouraged, fostering students' ability to evaluate their achievements in relation to a given task.

In this LS, different instruments were used to ensure assessment aligned with diversity and individual differences (Art. 11.4, O. of May 30, 2023). The PE4L model promoted peer and self-assessment, empowering students to evaluate their progress in relation to a given task (Pérez-Pueyo et al., 2021).

Table 2 outlines the procedures and assessment instruments used during the LS to track learning progress in relation to the assessment criteria. It is important to note that these tools have not been validated, as this is an innovation project.

Didactic Sequencing

The LS was carried out over nine sessions of 50 minutes each (Table 3). The first two sessions used the TGfU model, organizing students into pairs and groups of three. In subsequent sessions, using the SE model, the teacher formed five heterogeneous teams based on gender, motor competence, and learning pace. Within each team, students assumed roles such as coach, equipment manager, fitness trainer, or statistician, alongside additional roles. The sports court was divided into five zones or fields.

Statistical Analysis

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A descriptive analysis of the scores (means and standard deviations) obtained through the use of each evaluation instrument was conducted to assess the degree of achievement of the evaluation criteria (Criterion 2.1 related to social skills and Criterion 2.2 related to motor skills). Additionally, the final grade obtained by the students was analyzed. This analysis was performed by differentiating between both genders (boys and girls) and each work team (A, B, C, D, and E).

According to the results of the Shapiro-Wilk normality test, a contrast analysis was performed using the T-Student test for independent samples and the Mann-Whitney test, depending on whether the distribution of each instrument's sample was parametric or not, to determine if there were differences between the scores obtained by boys and girls. Additionally, an ANOVA test was conducted to check for differences in the scores of the different teams in both evaluation criteria and the final grade.

The analysis was carried out using SPSS Statistics 28 software. The significance level was set at 5% ($p < .05$).

Table No. 2. Assessment of the Learning Situation

EVALUATION CRITERION	EVIDENCE	INSTRUMENT	ASSESSMENT TYPE	TIMING
2.1. Participate in the process of creating individual, cooperative or collaborative motor projects, establishing mechanisms to redirect work processes, using self-assessment and co-assessment strategies with the help of and initiating attitudes of improvement, growth and resilience. (Social skills)	Individual work	Form "Evaluate yourself"	Individual self-assessment	Matchday 3
	Group work	Form "Let's evaluate our team"	Shared assessment	Matchday 4
2.2. Act correctly with an acceptable interpretation in varied motor contexts, applying with help basic principles of decision-making in playful situations, modified games and sports activities based on anticipation, adapting to motor demands, to the performance of the partner and the opponent (if applicable) and to the internal logic in facilitated performance contexts, real or simulated, reflecting on the results obtained. (Motor skills)	Teacher's diary and observation	Rubric for assessing motor skills (Figure No. 2)	Heteroassessment	Daily
	Challenges	Insignia	Peer assessment (individual and group)	Matchdays 1, 2, 3 y 4

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RUBRIC FOR ASSESSING DECISION-MAKING AND SPECIFIC SKILLS

SPECIFIC COMPETENCY 2					
	E (0-4)	**D (5)**	**C (6)**	**B (7-8)**	**A (9-10)**
Is capable of applying technical skills in game situations (both individually and as a team).	Does not recognize the different types of passing techniques and is unable to control the ball.	Knows half of the different types of passing techniques but does not apply them in game situations.	Performs passing techniques skilfully and applies them in basic game situations.	Knows all types of passing techniques and applies them in basic game situations.	Demonstrates advanced technical skills and knows how to use them in the game.
Demonstrates the ability to work as a team and respect teammates.	Shows no respect for teammates, and there is a lack of cooperation.	There is a sufficient level of respect, but only some team members participate.	Half of the team gets involved and participates in the game with respect and teamwork.	Most of the team participates in the game and collaborates positively.	They can cooperate and work as a team. Everyone participates and gets involved in the game equitably.
Makes appropriate decisions based on the teammate's and opponent's actions.	Does not understand teammates and opponents' actions.	Coordinates with teammates but does not anticipate or adapt to the opponent's play.	Coordinates with teammates and attempts to anticipate opponents' actions.	Successfully resolves most game situations by coordinating with teammates and anticipating the opponent's actions.	Successfully resolves game situations by coordinating effectively with teammates and anticipating opponents' actions.
Uses defensive and offensive tactics.	Does not understand game tactics and only returns the ball to the opponent.	Understands basic game tactics but always uses the same pattern.	Understands game tactics and applies them properly.	Has an in-depth understanding of game tactics and applies them in basic situations.	Has an in-depth understanding of game tactics. Resolves different game situations using creative and original tactics.
Understands motor limitations and reflects on areas for improvement.	Does not recognize personal limitations and weaknesses, nor attempts to improve.	Recognizes personal limitations and tries to improve.	Identifies some limitations and tries to improve.	Recognizes most limitations and tries to improve.	Knows motor limitations and reflects critically on how to improve. Works hard and tries to overcome themselves.

Figure No. 2. Rubric for assessing motor skills.

Table No. 3. Development of the learning situation on BigFlayerBall.

Session 1 CT	Presentation (introductory video) and initial reflection on alternative sports and the basic concepts of BFB. MS 1. Modified representation game (2vs1). Tactical awareness (finding open spaces and moving the opponent). • "What strategies have you used to anticipate the opponent's movements and improve the attack during the match?" • "In which areas of the field (back or front) have you managed to get the most points?" • In which situations did you find it most difficult to move the opponents and how could you improve in those situations? MS 2. Upper body pass. MS 3. 2vs1. Same exercise as SM1 but you must make 3 passes. MS 4. Modified representation game. Variation: 2vs2. Final reflection. • "What is the best strategy you have used to move the opponents?" • How did the position of your teammates influence your ability to find and use open spaces?
Session 2 CT	Initial reflection. MS 1. Modified role-playing game (3vs2). Tactical awareness (coordination with partner) • What type of communication did you use with your partner to ensure that you were both aligned in the execution of the play? • What adjustments did you make to your game to adapt to your partner's movements and decisions during plays? • What challenges did you encounter when trying to coordinate with your partner, and how did you overcome them?

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	MS 2. Throw-ins. 2+2. MS 3. Match. 3 vs 2. MS 4. Modified role-playing game. Variation. 3vs3. Final reflection: • Do you think that better coordination with your partner could have changed the outcome of a play? The teacher formed five mixed teams of 4, in an equal manner, taking into account the skills observed during the first sessions. The different roles and their functions were explained.
Session 3 Preseason	Initial reflection. The coaches prepared the tasks based on the initial information and the teacher's comments. Each team received different tasks. The final part was led by the physical trainer. The teacher held a general meeting with the coaches and explained the next session to them.
Session 4 Matchday 1 competition	Initial reflection. Main part: 15-minute matches. • Two matches were held: four teams participated and the fifth acted as organizer. This team was responsible for peer-assessing the others using badges for effort, teamwork and compliance with rules. In addition, it was in charge of recording the results and actions of the matches. • Matchdays 1 and 2: "first leg" matches, in which the visiting team wore vests.
Session 5 Matchday 2 competition	Same format as matchday 1. Final assembly: the coach reviewed the tasks that the coaches of each team prepared for session 7.
Session 6 Training	Initial reflection. Training led by the captains of each team in their assigned space. The session was supervised by the teacher and explained in the previous session. The teacher was a guide for the coaches and supervised the groups to verify the correct development of the exercises.
Session 7 Matchday 3 competition with secret cards	Initial reflection. Same format as matchdays 1 and 2. 15-minute matches and introduction of 3 secret cards (figure 1) per match and team.
Session 8 Matchday 4 competition with secret cards	Initial reflection. Same format as matchday 3. 15-minute matches. Use of 3 secret cards (figure 1) per match and team.
Session 9 Final Phase	For the final phase, cards similar to those in session 3 were used. Following the classification of the previous 3 days, they were given a card numbered from 1 to 5. The aim was to obtain card number 1. During the final part of the session, prizes and diplomas were awarded.

CT, Comprehensive Teaching; MS, motor situation.

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Results

According to the results of the scores obtained by students through the evaluation instruments linked to the evaluation criteria and the final grade (Table No. 4), we observe that, regarding Evaluation Criterion 2.1 related to social skills, 12% of students scored between 7 and 7.9, 72% scored between 8 and 8.9, and 16% scored above 9. Regarding Evaluation Criterion 2.2 related to motor skills, 12% of students scored between 6 and 6.9, 32% between 7 and 7.9, 36% between 8 and 8.9, and 20% scored above 9. Regarding final grades, 36% of students obtained a score between 7 and 7.9, 56% between 8 and 8.9, and 8% scored above 9.

Regarding the gender variable, no significant differences were found between boys and girls in the scores obtained in the evaluation criteria or in the final grade (Table 4).

Table No. 4. Statistical analysis of the results distinguishing by sex.

	Evaluation criterion 2.1 (social skills)						**Final Qualification**	
	Individual Form		Team Form		Qualification			
	M±DT	p	M±DT	p	M±DT	p	M±DT	p
Boys (n=15)	7,87±0,91	0,76	8,80±0,77	1,00	8,33±0,69	0,43	8,16±0,51	0,88
Girls (n=10)	8,00±0,81		8,80±0,78		8,40±0,31		8,20±0,53	
	Evaluation Criterion 2.2 (Motor Skills)							
	Rubric		Insignia		Qualification			
	M±DT	p	M±DT	p	M±DT	p		
Boys (n=15)	7,93±1,03	0,90	8,40±0,73	0,85	8,00±0,87	0,99		
Girls (n=10)	7,90±1,10		8,30±0,94		8,00±0,96			

The results of the descriptive study (Table 5) show that team D achieves significantly higher scores than the other teams in relation to evaluation criterion 2.1. However, the results of the post hoc comparisons, applying the Bonferroni correction, indicate that in the final grade this effect is only observed for this team.

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Table 5. Statistical analysis of the results distinguishing by team.

	Evaluation criterion 2.1 (social skills)				**Final Qualification**	
	Individual Form	Team Form	Qualification			
	M±DT	M±DT	M±DT		M±DT	p
All (n=25)	7,92±0,86	8,80±0,76	8,36±0,56		8,18±0,51	
Team A	8,20±0,83	8,00±0,00	8,10±0,41	p = 0,00	8,23±0,50	p = 0,02
Team B	7,60±0,54	9,00±0,00	8,30±0,27	ES: D-A = 2,58 D-B = 2,46 D-C = 2,58 D-E = 2,58	8,13±0,28	
Team C	7,20±0,83	9,00±0,00	8,10±0,41		7,70±0,30	ES: D-C = 2,37
Team D	8,40±0,89	10,00±0,00	9,20±0,44		8,71±0,52	
Team E	8,20±0,83	8,00±0,00	8,10±0,41		8,11±0,47	
	Evaluation Criterion 2.2 (Motor Skills)					
	Rubric	Insignia	Qualification			
	M±DT	M±DT	M±DT			
All (n=25)	7,92±1,03	8,36±0.81	8,00±0,89			
Team A	8,20±0,83	8,40±1,14	8,37±0,92	p = 0,02 ES: D-C = 2,37		
Team B	8,40±0,89	8,20±0,44	7,97±0,65			
Team C	7,00±1,41	8,20±0,44	7,30±0,89			
Team D	8,00±1,00	8,60±0,89	8,22±0,88			
Team E	8,00±0,70	8,40±1,14	8,12±1,00			

p, significance level; ES, effect size (d-Cohen).

Discussion

The aim of this study was to describe an LS on the alternative sport Bigflayerball in the first year of Compulsory Secondary Education, developed through a hybridization of pedagogical models (SEM, TGfU, and FSA), as well as to analyze its effect on students' social and motor skills.

To assess the effect of the LS on students' social and motor skills, continuous observation of the learning process was carried out in relation to evaluation criteria 2.1 (Participation in the process of creating individual, cooperative, or collaborative motor projects, establishing mechanisms to redirect work processes, using self-assessment and peer assessment strategies with support, and initiating attitudes of perseverance, growth, and resilience), related to students' social skills, and 2.2 (Acting correctly with an acceptable performance in various motor contexts, applying basic decision-making principles with support in playful situations, modified games, and sports activities based

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on anticipation, adapting to motor demands, teammates, opponents (if any), and the internal logic of facilitated, real, or simulated contexts, reflecting on the results obtained), related to motor skills. These criteria are included in Annex II of the Order of May 30, 2023. In line with this legal framework, different assessment tools (forms, rubrics, and badges) were used to evaluate students, ensuring coherence with evaluation criteria and students' specific characteristics, thus guaranteeing that the assessment adheres to the principle of diversity and individual differences. Since co-evaluation, peer assessment, and self-assessment must be encouraged, the ability of students to judge their achievements in relation to a specific task was strengthened.

The results do not show significant differences regarding gender in the scores obtained through different assessment tools. These findings suggest that this LS promotes coeducation and gender equality. Additionally, all teams obtained positive scores in both evaluation criteria, which are linked to collaborative and cooperative work. The implementation of methodological hybridization in the study appears to significantly contribute to the development of various social and motor skills. Similarly, other studies with the same methodological hybridization have yielded similar results. González-Fernández et al. (2023) observed improvements in these skills through small-sided football situations. Likewise, Gil-Arias et al. (2020) reported greater satisfaction of basic psychological needs and increased student motivation, particularly benefiting girls by offering more balanced experiences through game-based teaching. Furthermore, Aparicio et al. (2024) addressed Sustainable Development Goals 5 and 17 through the alternative sport BigBall-X, showing positive results. This study reinforces the potential of methodological hybridization in learning situations to enhance motor learning and student participation.

The intervention designed and implemented through this novel alternative sport, Bigflayerball, yielded positive results in evaluation criterion 2.1, related to social skills. These findings align with those of Diez-Fernández et al. (2024), who found that third-year secondary students preferred an alternative sport, such as Pinfuvote, over a conventional sport, such as volleyball, due to its ability to increase motivation, cooperation, and participation in PE classes. Similarly, both Méndez et al. (2015), using the alternative sport Ultimate, and Cuevas et al. (2015), teaching volleyball, found

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positive results in students' basic psychological needs through SE. In conclusion, practicing Bigflayerball in PE classes as an alternative divided-court sport seems to encourage student participation regardless of their technical-tactical level, fostering various situations that enhance social interactions.

Just as with social skills, students also obtained positive scores through the two instruments used to assess evaluation criterion 2.2, related to motor skills. Similarly, in the study by Hastie et al. (2009), students experienced skill acquisition in badminton and the ability to select tactical solutions after a SE-based program. In the present study, no student had prior knowledge or experience with Bigflayerball. Despite this, all students progressively acquired the technical gestures specific to this sport, enabling continuous physical practice with minimal interruptions. Calderón & Ayuso (2022) highlight that alternative sports offer an advantage by allowing all students to start from a similar skill and knowledge base, promoting more equitable and inclusive participation. In contrast, previous studies such as Araújo et al. (2020) on volleyball learning revealed that some students already had a solid foundation in the sport before the intervention, which could have influenced learning outcomes and pedagogical impact assessment. Thus, the use of Bigflayerball is justified by its simple motor skill requirements and adaptability to varying motor competencies within the group.

Regarding social skills and gender, no significant differences were observed between boys and girls in the scores obtained through the assessment tools for criterion 2.1. Some rules of Bigflayerball, such as the reduced number of players per field and the increased opportunities to interact with the ball in each play, ensure that all students remain active and engaged, preventing demotivation and boredom. This supports the use of alternative sports as a proposal to promote equal opportunities (Calderón & Ayuso, 2022). According to González-Coto et al. (2023), alternative sports like Quidditch provide an inclusive environment that minimizes gender differences by focusing on rules and strategies that encourage equitable participation. In contrast, in some traditional sports, gender discrepancies can be more pronounced due to stereotypes and traditional methodological approaches (Arenas et al., 2022), influencing participation and creating a less equitable environment (Smith, 2021).

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Regarding the relationship between motor skills and gender, no significant differences were found between boys and girls in the scores obtained through the evaluation instruments linked to criterion 2.2. Some characteristics of this alternative sport, such as the larger ball size or the available time to receive it with both hands, provide an advantage in ball control and, consequently, may facilitate the acquisition of specific motor skills. The results of this LS reinforce the conclusions of other studies that compared the learning of traditional and alternative sports, revealing significant differences in motor skill acquisition due to stereotypes and differentiated methodological approaches (Burgueño et al., 2020).

Regarding the results obtained by the different teams, differences were observed in social skills only between one team and the rest, with no significant differences in motor skills. It is likely that the SEM, by increasing the involvement of team members (Cuevas et al., 2015) and allowing even those with lower motor competence to develop specific skills and decision-making within the game (Hastie et al., 2009), along with the lack of experience in Bigflayerball, contributed to these results. Based on these findings, it can be suggested that teaching this alternative sport using stable teams, a characteristic of the SEM, creates an environment that promotes cooperative work, effort, adherence to rules, as well as the development of specific skills and decision-making.

The present LS on Bigflayerball, implemented through a hybridization of pedagogical models (SEM, TGfU, and FSA), has facilitated self-assessment, peer assessment, and shared assessment, encouraging students to take an active role in their teaching-learning process (López-Pastor et al., 2007). This suggests an improvement in their social skills and the creation of a suitable environment for developing the motor skills inherent to this innovative alternative sport. In line with this, Fraile et al. (2021) highlight that FSA enhances learning by increasing student engagement, allowing for the identification and reinforcement of both strengths and areas for improvement in the teaching-learning process.

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Conclusions

This innovation study concludes that an LS on the alternative sport Bigflayerball using a hybridization of pedagogical models (SEM, TGfU, and FSA) appears to contribute to the acquisition of subject-specific competencies in PE, developing students' social and motor skills in secondary education.

The information gathered in this innovation study is useful for PE teachers, educators, and students in their professional development and training.

Improvement proposals and study limitations

This innovation study presents the following limitations: 1) the small sample size hinders generalization of results and reduces statistical power, 2) no pretest was conducted to determine students' initial level, 3) no control group was included to isolate the specific effect of the LS, 4) non-validated assessment tools were used, which may introduce measurement errors, and 5) the success of the LS may depend on the teacher's experience and skills, limiting replicability with different educators.

To mitigate these limitations, the following improvements are proposed: 1) increasing the sample size to generalize results, 2) implementing the LS in different contexts and grade levels, 3) including control groups to assess the specific effect of the LS, and 4) ensuring the validity and reliability of assessment tools.

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Sportis
Revista Técnico-Científica del Deporte Escolar, Educación Física y Psicomotricidad
Scientific Technical Journal of School Sport, Physical Education and Psychomotricity
Editor: University of A Coruña. A Coruña. Spain
ISSN-e 2386-8333
E-mail: sportis.journal@udc.es Web: https://revistas.udc.es
OPEN ACCESS Creative Commons

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