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Original Article

Implementation of the "Shuttle Time" Project in School Physical Education in Serbia

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Abstract

Badminton is an Olympic racket sport played with a shuttlecock and is characterized by high physiological demands, involving a combination of aerobic and anaerobic energy systems. In addition to its competitive aspect, badminton has a significant positive effect on the physical, mental and social health of participants. This study aims to analyze the implementation of the "Shuttle Time" program in Serbia, with a particular focus on its coverage, organizational development, and factors affecting its long-term sustainability. Shuttle time is an educational program of the Badminton World Federation designed to promote badminton among children and to support PE teachers in its delivery in schools through teaching materials, lesson plans, video resources and equipment. The study was conducted as a descriptive case study using official project documentation, including reports from 15 Shuttle Time courses (2017–2025), and data from the Badminton Association of Serbia. Program implementation was assessed through descriptive and SWOT analyses based on implementation indicators and sustainability-related factors. In Serbia, the project has been implemented since 2017 through courses at the National Badminton Center in Belgrade. By 2025, 15 courses had been delivered, 375 teachers and students of sport had been trained, 126 schools from 48 municipalities had been involved and more than 20,000 pupils had taken part. The results indicate significant potential for further development, with accessibility and educational value as key strengths, while financial limitations and institutional support remain the main challenges.

Keywords: School sports, Physical activity, Teacher education, SWOT analysis.

Introduction

In primary school, physical education (PE) plays an important role in students' bio-psycho-social development, as well as in building long-term habits of regular physical activity and adopting healthy movement patterns from an early age (World Health Organization, 2018). The modern curriculum focuses on activities that are safe, accessible and suitable for pupils of different age and motor skill levels (UNESCO, 2015). In this context, badminton is a great choice when organizing PE classes in schools, while the Badminton World Federation's (BWF) "Shuttle Time" project provides teachers with methodological and didactic support for its integration into the curriculum.

Badminton is an indoor Olympic sport in which a shuttlecock is hit with a racket, with competitions held in both singles and doubles (men's, women's and mixed) events (Badminton savez Srbije, 2026). The sport combines aerobic and anaerobic physical demands while simultaneously developing VO2max, coordination, agility, reaction speed and motor control (Phomsoupha & Laffaye, 2015; Alcock & Cable, 2009).

Previous studies have highlighted positive effects of badminton participation on physical fitness, social interaction, concentration, sleep quality, stress management, psychological well-being and motor abilities among children and adolescents even with developmental disabilities (Ying, 2024; Zhang et al., 2025; Cabello-Manrique et al., 2003; Wang et al., 2023; Duncan et al., 2020, 2023). Besides its recreational and health-related value, badminton has considerable educational potential in school environments. The sport enables the inclusion of pupils with different skill levels, encourages cooperation and communication, and can be implemented even in schools with limited material resources.

Shuttle time is a project of the BWF aimed at popularizing badminton among children aged 5 to 15 and introducing the sport into school PE programs worldwide (Badminton World Federation, 2018). It is designed to help PE teachers deliver engaging badminton lessons and encourage students to independently engage in this activity (Badminton savez Srbije, 2017). The badminton training program includes basic technical, tactical and physical skills specific to the sport and it is adapted for beginners and the school environment.

Globally, Shuttle time has been implemented in more than 160 countries, through over 3,500 courses and the training of around 85,000 teachers, enabling more than four and a half million children to learn basic badminton skills (Badminton World Federation, 2025). Despite its widespread international implementation, limited scientific evidence is available on the long-term implementation and sustainability of the Shuttle Time program at the national level. Most available information is based on administrative reports, while analyses of organizational and contextual factors influencing program development remain scarce.

The study contributes to the existing literature by examining the implementation and sustainability of the Shuttle Time program in Serbia through a combination of implementation data and SWOT analysis. This study aims to analyze the program's coverage, organizational development, and factors affecting its long-term sustainability.

Material and Methods

Research Design

This study was designed as a descriptive case study based on document analysis and supplemented by a SWOT analysis of the program's implementation and sustainability. The analysis focused on the implementation of the Shuttle time program in Serbia, as the national implementation of the global Shuttle Time project, and included the review of project documentation, strategic planning documents, and program reports from 2017 to 2025. All data related to the delivery of the program in Serbia were obtained from the database of the Badminton Association of Serbia. The unified course database contains information on teachers involved in the implementation of the program, participating schools, and the number and age distribution of boys and girls who took part in the educational activities. The analysis included National Planning Documents for the periods 2017–2020 and 2021–2024, as well as reports from all 15 Shuttle Time courses conducted in Serbia between 2017 and 2025. All National Planning Documents and Course Reports included in the analysis are part of the official reports submitted by the Badminton Association of Serbia to the Badminton Europe Confederation (BEC) and the BWF. Descriptive analysis was used to summarize the results of the program at the national level. In addition, a SWOT analysis (strengths, weaknesses, opportunities, and threats) was conducted

to identify internal and external factors affecting the program's development and sustainability in Serbia. SWOT factors were identified through the analysis of quantitative indicators derived from the Shuttle Time Course Reports and project documentation, complemented by the authors' informed assessment based on the analysis of the institutional, regulatory, economic, and social context in Serbia. The evaluation process involved all authors of the study. No formal expert consultations or external evaluation reports were used; instead, the analysis relied on the interpretation of the available data.

Validity and Reliability

The validity of the study was supported by the use of official project documentation and program records obtained from the Badminton Association of Serbia. These documents were generated through the program's regular monitoring and reporting procedures, ensuring the authenticity and traceability of the data sources. The reliability of the analysis was enhanced through the use of a unified database containing standardized information on course participants, schools, and student involvement. Furthermore, all authors participated in the identification and interpretation of SWOT factors, which helped reduce individual bias and improve the consistency of the analysis.

Project implementation

The first step for PE teachers and students of sport faculties is to attend a Shuttle time course, which lasts for a day or two. The course is delivered by instructors who, in addition to playing and coaching badminton, are also familiar with the specifics of school teaching and working with children. The course begins with a theoretical part, where participants are introduced to the project's aims, followed by a practical session covering 22 lessons that are included in the program. The training is interactive, with all necessary teaching materials available in a handbook, an app and video resources. After successfully completing the course, participants receive BWF's certificate, which allows them to independently conduct badminton training in their schools, as well as the necessary equipment for delivering PE classes.

Resources

On the official Shuttle time website, all materials needed for the implementation of the program's activities are freely available after registration. The written resources are translated into 30 languages and they include:

Teachers' Manual: its aim is to present all information that is important for teachers when applying the project in practice (managing groups during training, description of activities for developing physical abilities, different competition formats...) (Badminton World Federation. (2022c);

Lesson Plans: a total of 22 lessons, devided into four sections. Each section builds on the skills learned in previous lessons, while introducing new, more demanding elements, in terms of coordination. All lessons are in line with the standard structure of a PE class, including Warm-up, Main Activity and Cool Down, and they involve physical exercises, technical/tactical badminton elements and fun and competition activities (Badminton World Federation. (2022b);

Video clips: each exercise within the lessons is supported not only by written explanation, but also a video demonstration, with total of 92 videos available for download via the website or app;

Inclusivity Guide for Teachers: an extension of the Teachers' Manual, focusing on adapting badminton lessons for all students who face certain learning difficulties (Badminton World Federation. (2022a);

Mobile Application: includes lesson plans, video materials, a scoreboard, a drawing board and a competition draw system;

Equipment: after completing a course, representatives of each school receive a badminton equipment set that includes 16 rackets, 24 nylon shuttlecocks, 4 nets and a bag.

Results

Since 2017, courses have been continuously held at the National Badminton Center in Belgrade, with a total of 15 courses delivered by the end of 2025. Over the years, the results of the Shuttle time program implementation in Serbia are reflected in 375 trained teachers and students from faculties of sport and physical education, 126 schools from 48 municipalities whose teachers participated in the course and more than 20,000 pupils who have taken part in badminton training in their schools.

In 2017, project coordinators in Serbia adopted a four-year strategic plan for national implementation. Within this plan, four annual operational plans were developed. Specific targets, such as the number of courses, participants and schools, were evenly distributed across the years to ensure continuous and balanced program development. Part of the strategic plan and achieved results for the period from 2017 to 2020 are presented in Table 1.

Table 1. Strategic Development Plan of the Shuttle time project in Serbia (2017–2020).

	Target number	**Achieved number**
Courses	7–8	8
Participants	170–210	159
Schools	55–75	76
Pupils	10,000–12,000	10,309
Faculties	7	2
Badminton equipment sets donated	200	85
Building connections between local badminton clubs and schools	Implement Shuttle time in cities where badminton clubs/associations already exist (providing educational, technical, administrative support).	35 cities across Serbia had their representatives at the courses, with the largest number of participants coming from areas near the most developed badminton centers in Serbia (Belgrade, Novi Sad, Krusevac).
Organization of regional competitions for pupils	Organize local tournaments in cities where multiple schools regularly implement Shuttle time program.	A total of 13 inter-school tournaments were organized, in 4 different cities.

Based on the results achieved up to that point, a new strategic plan was developed for the period from January 2021 to December 2024, as presented in Table 2. The increase in the number of participants compared to the previous cycle was planned by organizing courses exclusively for students of sport and physical education, in cooperation with faculties.

Tabela 2. Strategic Development Plan of the Shuttle time project in Serbia (2021–2024).

	Target number	**Achieved number**
Courses	8–10	6

Participants	200–300	146
Schools	60–90	32
Pupils	8,000–10,000	4,700
Faculties	5	3
Badminton equipment sets donated	100	40
Building connections between local badminton clubs and schools	In addition to regular courses for teachers, organize courses exclusively for students of sport and physical education (future PE teachers).	Students from 3 additional faculties attended the course. Faculty of Sport and Physical Education of University of Belgrade and Badminton Association of Serbia signed a 5-year cooperation agreement.
Organization of regional competitions for pupils	Continue organizing inter-school tournaments across the country.	A total of 8 inter-school tournaments were organized, in 3 different cities.

Identifying internal and external factors through SWOT analysis provides a basis for developing strategies for further progress. By combining these factors, specific directions for action can be defined, making it possible to formulate four types of strategies, with examples shown in Table 3.

Table 3. Proposed strategy development matrix based on SWOT analysis.

	Strengths	**Weaknesses**
Opportunities	Availability of human resources and the initiative of those involved in the implementation, positive feedback from participants of previous seminars. The possibility of organizing courses in other cities, lack of similar project in Serbia. Strategy: promote the project in cities across Serbia – cooperation with clubs, personal contacts, fairs, presentations.	Insufficient financial resources to purchase equipment from own budget. The growing success of Serbian professional badminton players on international competitions, establishing international partnerships. Strategy: increase the number of Serbian players competing in countries where badminton is more prominent and sponsorship opportunities are greater.
Threaths	Providing schools with free equipment for PE classes, especially those with limited teaching conditions. Lack of space within the curriculum for introducing new teaching content. Strategy: focus on strengthening cooperation and providing training for teachers working in such schools.	Insufficient financial resources to purchase equipment from own budget. Reduced financial support from state institutions. Strategy: organize seminars without equipment donations for students of sport and physical education and establish cooperation with multiple universities.

Target values presented in Tables 1 and 2 were obtained from the National Planning Documents for the periods 2017–2020 and 2021–2024, while the achieved values were calculated based on data from Shuttle Time Course Reports for all courses conducted during the respective implementation periods.

In 2025, one Shuttle time course was held, during which a total of 70 students and teachers from 18 primary and secondary schools were trained.

Discussion

Since 2017, the Shuttle time program has been continuously implemented at the National Badminton Center in Belgrade. The results indicate successful integration into the Serbian school system through the education of teachers and students, the involvement of an increasing number of schools, and the engagement of a large number of pupils.

One of the key elements of the project's implementation in Serbia is the education of PE teachers and students of sport and physical education faculties. Previous studies emphasize that teacher competence and confidence strongly influence the successful introduction of new physical activities into school curricula (Morgan & Hansen, 2008; Ní Chróinín & Coulter, 2012). Teachers who receive practical training, structured lesson plans and institutional support are more likely to apply innovative teaching content in PE classes. In this regard, the Shuttle time program provides a comprehensive educational model that combines theoretical instruction, practical demonstrations and ready-to-use teaching materials. Previous research also suggests that sports programs integrated into PE classes are more sustainable when they can be adapted to schools with different organizational and material capacities (Bailey et al., 2009). The availability of free lesson plans, manuals, video materials and equipment therefore represents one of the project's most important advantages.

The importance of educational resources and professional development has also been highlighted in broader school sport literature. Sustainable school-based physical activity programs require continuous cooperation between educational institutions, sport organizations and local communities (Haerens et al., 2011). The cooperation established between the Faculty of Sport and Physical Education in Belgrade and the Badminton Association of Serbia therefore represents an important step toward long-term sustainability, particularly through the inclusion of future PE teachers in the program.

By analyzing the results achieved at the end of the first four-year cycle, it can be concluded that most of the goals and objectives set out in the strategic plan were successfully met. Out of 29 administrative districts in Serbia, 17 (58.6%) were provided with human and material resources to implement the program in at least one school. The number of course participants was lower than expected; however, the number of schools included in the project was exceeded. In addition, students were given the opportunity to compete through school and inter-school tournaments. The least successful objective was the training of students of sport. As a result, future efforts primarily focus on educating future PE teachers, followed by those already working in schools.

During the implementation of the project, activities were significantly disrupted by the COVID-19 pandemic, which prevented the planned courses from taking place between March 2020 and January 2022.

Shifting the focus of the course toward training university students rather than teachers has slowed the growth in the number of schools implementing the program. The main reason for this is reduced financial support from state institutions and sponsors, which has especially affected the purchase of badminton equipment sets. In addition, the decline in global economic activity caused by the pandemic, reduced funding during the Tokyo 2021 and Paris 2024 Olympic games for sports without national representation and lack of recognition of the project's importance by institutions have all contributed to limiting the project's potential in Serbia.

SWOT analysis

Strengths: Efficient organization of courses, enabling education of a large number of participants within a short period of time; Experienced instructors with strong backgrounds in badminton, teaching methodology and promotional activities; Availability of free and accessible teaching materials, including manuals, lesson plans, videos and mobile application support; Adaptability of the program for schools with different material and spatial conditions; Provision of free badminton equipment for

schools participating in the project; Positive educational and developmental effects on pupils, including increased physical activity, social interaction and motor skill development; Strong motivation and engagement of project coordinators and participants; Successful cooperation with the Faculty of Sport and Physical Education in Belgrade, contributing to the education of future PE teachers; Positive feedback from teachers and students who attended previous courses.

Weaknesses: Insufficient financial resources to purchase equipment from own budget – possibility of slowing down the expansion of the project; A small number of people trained to deliver the course – limited capacity can disrupt the growth of the project.

Opportunities: Lack of similar school-based badminton projects in Serbia; Possibility of organizing courses in additional cities and regions; Potential cooperation with the School Sport Federation of Serbia and educational institutions; Increasing international success of Serbian badminton players, contributing to greater visibility of the sport; Expansion of partnerships with foreign badminton organizations and institutions; Growing interest in recreational and inclusive sports activities suitable for all age groups.

Threats: Insufficient institutional and financial support from state authorities; Limited space within the PE curriculum for introducing new teaching content; Low overall popularity and public visibility of badminton in Serbia; Competition from other increasingly popular recreational sports and activities; Lack of motivation or interest among some PE teachers to implement additional sports programs.

This analysis shows that the project has numerous strengths and opportunities that can contribute to its success. The main challenges lie in financial limitations, which require the exploration of additional funding sources.

The study is limited by its descriptive design and reliance on project documentation without primary data collection from participants. In addition, the SWOT analysis includes an interpretative component inherent to qualitative synthesis, while long-term educational and health outcomes of the program were beyond the scope of this study.

Conclusions

Shuttle time is a BWF project that was launched in 2012 with the aim of introducing badminton into physical education classes and increasing its participation among school-aged children. The project is designed to support teachers through training and by providing the resources needed to deliver lessons effectively. Implementation of Shuttle time program includes teacher training through courses, after which participants receive an international certificate and equipment required for conducting classes. In Serbia, 375 teachers and students from 126 schools have been trained through 15 seminars, while more than 20,000 pupils have been introduced to the basics of badminton. The project has reached 48 municipalities across the country. The first four-year cycle (2017–2020) was successfully completed, while the following period showed a slowdown in development due to limited financial resources. Specific recommendations for future project development include stronger institutional cooperation with ministries, schools and universities. Ministries responsible for education and sport could support the accreditation of Shuttle time courses as part of teachers' professional development programs, enabling PE teachers to receive official credits for participation. Schools could implement the Shuttle time program within extracurricular or elective physical activity modules ("free teaching activities") in cases where there is limited space within the official curriculum, while badminton could also be included in the system of school competitions

at municipal, city and national levels. Universities and faculties of sport and physical education could further integrate the Shuttle time program into courses related to racket sports and recreation, using the existing "Shuttle Time University Course" model developed by the BWF. A SWOT analysis indicates significant potential for further development of the project in Serbia.

Future research should examine the long-term effects of the Shuttle Time program on pupils, incorporate evaluations from teachers and students, and compare implementation models across different countries. Further studies could also explore institutional support mechanisms and factors influencing program sustainability.

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