



Development of Badminton High Clear Shot Training Program of Students Aged Between 8-10 Years

Chen Mingchun¹, Prakrit Hongseanyatham² and Nopporn Tasnaina³

^{1,2,3}Faculty of Sports Science and Technology, Bangkokthonburi University, Thailand

¹E-mail: 375291661@qq.com, ORCID ID: <https://orcid.org/0009-0006-5718-3997>

²E-mail: prakitsport@gmail.com, ORCID ID: <https://orcid.org/0009-0009-2196-0258>

³E-mail: aipia2489@gmail.com, ORCID ID: <https://orcid.org/0009-0001-6086-0657>

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Abstract

Background and Aim: The proficiency of badminton skills among students aged 8-10 years in primary school is a significant concern, as there is a noticeable lack of tailored training programs specifically designed for this age group. Therefore, this research aims to develop a badminton high clear shot training program for students aged between 8-10 years, and to improve the efficiency of badminton training of high clear shot skill, instill a passion for sports, encourage regular physical activity, and promote overall physical and mental well-being in children.

Materials and Methods: This research is quasi-experimental. The population of this research was 79 students aged between 8-10 years in the badminton club at Shenzhen Nanshan Foreign Languages School Dachong Primary School. Through a high clear shot skill test, 30 students with low test scores who volunteered to participate in the research were selected as the sample group. This research will conduct 8 weeks of training to improve badminton high clear shot skill, and the testing for the badminton high clear shot will be before training, after 4 weeks of training, and after 8 weeks of training. In this research, mean, standard deviation, one-way repeated measures ANOVA, and dependent t-tests were utilized to analyze the data. The level of significant difference was 0.05.

Results: After 8 weeks of training, there was a significant difference between the pre-test, after 4 weeks of training, and post-test of the results of the high clear shot test. Therefore, the students showed significant improvement in their badminton high clear shot skills after training with the developed badminton training program.

Conclusion: The developed training program is effective in enhancing high clear shot skills among students aged between 8-10 years and can be utilized in the development of badminton education at the primary school level.

Keywords: Badminton Training Program; High Clear Shot; Student Aged Between 8-10 Years

Introduction

Badminton, known for its accessibility, substantial exercise benefits, and adjustable intensity, is widely embraced by teenagers and children. Its manageable exercise volume, low injury risk, high public acceptance, and minimal venue requirements contribute to its popularity. Some primary and secondary schools have even integrated badminton into their physical education curriculum. Given its technological orientation, badminton demands a relatively high level of both skill and physical fitness. In cases where students struggle to grasp technical movements or lack a solid foundation, their progress in badminton may be hindered, potentially leading to poor exercise habits, increased injury risks, and a potential aversion to the sport. Therefore, research on badminton teaching methods is essential, aligning with the demands of school badminton classes and providing a basis for the efficient selection of instructional approaches in educational settings (Zhao, 2018).

Beyond enhancing physical fitness and responsiveness, badminton has demonstrated positive effects on both physical and mental well-being. With the introduction of the concept of national sports, there is a growing interest in physical activity, prompting more individuals to engage in their preferred sports. Badminton practice provides students with a means to alleviate academic stress while maintaining a balance between work and leisure. As the educational reform process gains momentum, there is an increasing demand for stringent requirements in badminton teaching within schools. Educational institutions are placing greater emphasis on delivering effective badminton instruction to students (Liu et al, 2021).

Relative to other shots in badminton, the high clear shot is relatively easy to learn. Compared to drop shots and smashes, the high clear shot is easier for beginners to grasp. Beginners can quickly master the basic swing motion and successfully hit the shuttlecock into the opponent's court. In badminton, shots such as smashes, drops, and drives all evolve from the basic motion of the high serve, with variations in the point of contact, power, and swing motion. Therefore, mastering the high clear shot is crucial. After successfully hitting a high clear shot, it can give children positive feedback and





enhance their confidence. These early successful experiences help spark their interest in badminton and encourage them to continue learning and improving. In the initial stages of learning badminton, the technical requirements for high clear shots are relatively low, which reduces the technical pressure on beginners (Lee & Ryu, 2016). They can focus on mastering basic skills without worrying about complex tactics or technical demands. Starting with a high clear shot helps beginners establish fundamental swing techniques, build confidence, and lay a solid foundation for gradually learning more complex techniques and tactics.

Children between the ages of 8 and 10 undergo a crucial phase of motor development, marked by emerging expressive abilities, burgeoning self-esteem, physiological changes, and rapid intellectual growth. Initially, many children exhibit reluctance to engage in sports activities, showcasing low interest and resistance to making new friends or exploring new experiences. Some may only participate due to external influences, such as the surrounding environment or parental insistence. However, as they become acquainted with badminton, interest tends to grow, and with a deepened understanding of the sport, familiarity with the learning environment, camaraderie among friends, engaging competition, and personal technical improvement, their enthusiasm and motivation for learning are further ignited. Children in this developmental stage can experience the joy derived from badminton, fostering self-confidence and a more open-minded approach. Considering the physical and mental characteristics of students aged 8 to 10, a thoughtfully designed and engaging teaching approach proves beneficial in mastering fundamental techniques and enhancing physical fitness. The study of badminton multi-ball techniques should be tailored to the distinct physical and mental development traits across different age groups. Effective character development necessitates targeted teaching and practice to yield the most significant impact (Xing, 2011).

The proficiency of badminton skills among students aged 8-10 years in primary school is a significant concern, as there is a noticeable lack of tailored training programs specifically designed for this age group. These young learners, at a critical stage of physical and cognitive development, often encounter challenges in acquiring fundamental badminton skills due to the absence of targeted training initiatives. The absence of a structured approach to skill development in badminton during these formative years prompts the need for an in-depth investigation and the formulation of an effective training program. Therefore, the development of effective sports training programs for children aged 8-10 years is crucial for their holistic growth and skill enhancement. Despite the acknowledged benefits of engaging in physical activities like badminton during this developmental stage, there is a notable gap in tailored training programs specifically designed to address the unique needs and capabilities of this age group. The objective of this research is to cultivate a proper understanding of badminton among children aged 8 to 10, fostering an early appreciation for the sport and encouraging active participation in school badminton activities. By developing a badminton training program to improve the badminton skills of students, the research aims to improve their badminton high clear shot skills and identify the most effective training program for this specific age group. During the early stages of learning badminton, the technical demands for executing a high clear shot are relatively minimal, alleviating the technical pressure on beginners. This allows them to concentrate on mastering fundamental skills without the concern of complex tactics or technical intricacies. The ultimate goal is to improve the efficiency of badminton training of high clear shot skill, instill a passion for sports, encourage regular physical activity, and promote overall physical and mental well-being in children. This research through a questionnaire survey method to investigate the current situation and the problems of badminton training of students aged between 8-10 years. After that, the researcher will conduct the experts' interview and focus group to develop a badminton high clear shot training program to improve badminton high clear shot skills among students aged 8-10 years.

Objectives

Main objective

To develop a badminton high clear shot training program for students aged between 8-10 years.

Subsidiary objectives

1. To study the current situation and the problems of badminton high clear shot learning of students aged between 8-10 years.
2. To draft a badminton high clear shot training program for students aged between 8-10 years.
3. To confirm badminton high clear shot training program of students aged between 8-10 years.

Literature Review

1. Badminton

1.1 Badminton in China's Schools and Universities

Currently, with the global development trend of badminton, the sport has become widely prevalent in schools and universities in China. This has significantly promoted the growth of badminton at the schools and universities level. As the playing and training methods of badminton continue to evolve, it is essential to adapt and update schools' and universities' training techniques to keep pace with these advancements. Physical education teachers must engage in thorough research and practical application in their teaching, tailored to the actual training levels of college students. By guiding students to discover training methods that suit them, teachers can help continuously improve their badminton skills. This approach will lead to the better development and enhancement of college badminton programs (Yang, 2017).

In current physical education programs at colleges and universities, badminton has seen significant development. However, certain issues restrict and hinder its further progress. The most significant factor is the inadequacy of current training methods. As a complex sport, badminton requires athletes to have a high level of technical and tactical proficiency. Students must learn and master basic techniques and competition strategies to excel in badminton training. For example, students need to become proficient in techniques such as the forehand high serve, forehand and backhand shots, and footwork for front and backcourt movement. Mastering these basic skills requires scientific and reasonable training methods. Teachers can employ two primary training approaches in their daily instruction:

1. Basic Technical Training: Students should first learn and understand the theoretical knowledge of badminton techniques. Teachers should then conduct basic technical training sessions, helping students strengthen their technical awareness through repeated practice. This process allows students to develop psychological reflexes, enabling them to perform relevant technical movements naturally during play. However, this solidification of skills is not static and must evolve with time. Teachers should guide students to continuously improve and perfect their techniques.

2. Competition Training: Implementing the "training through competition" approach is crucial. By engaging in actual matches, students can test their training levels, identify issues, and improve their skills effectively. This method ensures that students' badminton techniques are constantly refined and adapted to meet the demands of competitive play (Liu, 2015).

1.2. Badminton Skills

Badminton skill refers to the technical proficiency, physical capabilities, and tactical understanding that empower a player to excel in the sport. It encompasses a spectrum of elements within the game, including stroke technique, footwork, agility, shot precision, speed, endurance, tactical acumen, and mental fortitude. According to Subarjah (2010), badminton demands considerable physical prowess, characterized by swift movements and powerful strokes executed within seconds during protracted rallies.

Achieving mastery in essential skills is pivotal for success in badminton, encompassing proper racket grip, correct standing posture, precise footwork, and effective shuttlecock hitting. These foundational skills serve as the cornerstone for excellence in the sport, allowing players to maneuver the court with agility, deliver pinpoint shots, and partake in the exhilarating gameplay of badminton. A pivotal accomplishment in coaching badminton involves equipping athletes or students with the proficiency to master the fundamental technical skills essential for playing the sport. This aligns with the fundamental principle that athletes or students, particularly beginners in badminton (Bahri & Permadi, 2019; Bimantara et al., 2022), must acquire foundational skills (Zainuddin et al., 2022). Those with a solid grasp of fundamental skills are better positioned to execute effective attacks and defenses while implementing strategic maneuvers.

2. Badminton High Clear Shot Skill

The "high clear shot" in badminton is a fundamental technique used to regain control of the rally or create an offensive opportunity. It involves hitting the shuttlecock high and deep into the opponent's court, usually towards the back boundary line. This shot is characterized by a steep trajectory, allowing

the player time to reposition themselves on the court while putting pressure on the opponent to respond (Lee, 2008)

Smith (2019) indicated that the high clear shot in badminton is a fundamental skill used to push the opponent to the back of the court, creating space for strategic play. The techniques for the high clear shot are as follows: (1) Grip: Hold the racket with a firm grip using either the forehand or backhand grip, depending on the situation and your preference; (2) Stance: Adopt a balanced stance with your feet shoulder-width apart. Position yourself slightly behind the shuttle to generate power; (3) Backswing: Bring the racket back behind your body, preparing for the shot. The racket head should be higher than the grip, and your non-racket arm can point toward the shuttle for balance; (4) Execution: Swing the racket forward in a smooth motion, making contact with the shuttle slightly above your head. Aim to strike the shuttle with a flat racket face to generate height and distance; (5) Follow-through: After hitting the shuttle, continue the motion of your racket towards the direction of the shot. This helps maintain control and accuracy; (6) Footwork: Move quickly to the ideal position to set up for the next shot after executing the high clear. This might involve returning to the center of the court or anticipating your opponent's response; (7) Timing: Mastering the timing of the shot is crucial. Hit the shuttle at the highest point possible to achieve maximum height and distance.

The high clear shot is a fundamental technique in badminton, essential for defensive play and establishing control during rallies. The high clear shot is executed by hitting the shuttlecock with a high, deep trajectory toward the opponent's backcourt. This shot is used to push the opponent back, create space, and gain time to reposition or set up for the next shot. Use the forehand grip, holding the racket with a relaxed but firm grip. Position yourself with feet shoulder-width apart, knees slightly bent. Hold the racket back and keep your non-racket arm up for balance. Use a smooth, upward motion with the racket to strike the shuttlecock. The racket head should be slightly angled upwards, and the shot should be executed with a full follow-through, and then the follow-through should be controlled, aiming to direct the shuttlecock high and deep into the opponent's court (Johnson, 2019)

Lee and Tan (2021) the badminton high clear shot is a fundamental technique used to send the shuttlecock high and deep into the opponent's court, typically from the back of one's court. This shot is employed to create space, gain time, and force the opponent to move backward, setting up for offensive or defensive strategies.

Moreover, the significance of a high clear shot is to allow players to recover from defensive positions and regain control of the rally. Forces opponents to move back, potentially opening up opportunities for attacking shots, and provides the player with extra time to reposition and plan the next move (Kumar and Patel, 2021).

3. Badminton Training Program

Badminton stands out as one of the most widely embraced racket sports globally, experiencing a rapid surge in popularity. Characterized by short-term, repetitive movements of high speed and intensity within an 80 m² area (Lees, 2003), badminton involves dynamic elements such as changes of direction, jumps, forward and backward maneuvers, rapid arm movements, and a diverse range of positions.

Training for badminton including on-court footwork and other movements, should consider gender-based differences in aerobic and anaerobic capacities between male and female athletes (Fu et al., 2021). Considerations should also be given to factors such as the impact of fatigue on injury risks, the athlete's level of performance (Mei et al., 2017), and the physiological load and biomechanical impact (Alder et al., 2019).

During the training process, students must maintain the consistency and stability of the racket shape, make consistent movements such as rubbing, hooking, and picking, and insist on grabbing the high point of the ball when handling the ball in front of the net. When hitting the backcourt ball, step back sideways and keep the racket shape consistent when hitting high and low balls. Gradually form the habit of jumping into the air to hit the ball. Even if the body feels tired, it is necessary to maintain stable movements and standard steps. When the brain and body are in a state of hypoxic fatigue, students still need to stay awake and handle the ball correctly. During the training process, students should pay attention to the formation and establishment of a sense of perseverance and a hard-working attitude (Li, 2022).

Ozman and Gallahue (2016) emphasize the importance of providing children with a diverse range of physical activities to enhance and support their holistic development. However, these physical activities must align with their age and physical characteristics, ensuring developmental appropriateness. Numerous activities exist that can captivate the interest of children across different age groups while fostering their healthy development.

Based on the above studies, the training program is considered one of the most important components of the successful performance of a badminton player. Training programs for badminton players should be designed properly to the age and ability of the students.

4. Developmental Milestones for Children aged 8-10 years

In line with Canada's Long-Term Athlete Development Model, the age range of 8 to 11 years is identified as the optimal period for acquiring "Fundamental Sport Skills," commonly referred to as the "Learn to Train" stage. This stage is particularly significant for the development of sport-specific skills, with boys aged 9-12 years and girls aged 9-11 years experiencing accelerated learning in coordination and fine motor control. It marks a crucial phase where children take pleasure in practicing newfound skills and witnessing their progress. Additionally, this period emphasizes the refinement of fundamental movement skills and the acquisition of overall sports skills. Moreover, during the Learn to Train stage, the brain approaches adult size and complexity, showcasing a capacity for highly refined skill performance (Canadian Sport Centres, 2016). Consequently, studying badminton training in 8-18 years old students holds significant importance and benefits. Given that children within this age group are in the prime stage for skill acquisition and rapid learning, examining their development in badminton skills allows for a clear understanding. Subsequently, this insight aids in devising training programs geared towards further enhancing their badminton skills in the future.

Children aged 8-10 find themselves in the middle childhood stage, characterized by a notable increase in independence from the family and a heightened interest in forming friendships. The cultivation of healthy relationships during this period is pivotal for overall development. It's crucial to acknowledge that peer pressure can exert influence during this phase, making it essential for children to maintain a positive self-image, enabling them to resist negative influences and make informed decisions. This stage also marks a significant time for children to develop a sense of responsibility alongside their expanding independence. Moreover, the onset of physical changes associated with puberty, particularly noticeable in girls, is a part of this developmental phase. Another significant transition during this stage is the commencement of middle or junior high school (Centers for Disease Control and Prevention, 2021).

5. Related Research

Ankit & Verma, (2019) in the Effect of Different Training Methods on the Development of High Clear Shot in Badminton, investigates the effectiveness of various training methods on the performance of high clear shots in badminton. Results indicate that a combination of drill practice and match play significantly enhances the execution of high clear shots among intermediate players.

Smith (2019) in Badminton Techniques: Mastering the High Clear Shot, explores the essential techniques involved in executing a high clear shot in badminton, a fundamental skill for players of all levels. Drawing on insights from professional coaches and players, the author provides detailed instructions on grip, stance, backswing, execution, follow-through, footwork, and timing. Additionally, the article offers practical tips for improving consistency and accuracy in executing the high clear shot, along with common mistakes to avoid. With clear illustrations and examples, this reference serves as a valuable resource for badminton enthusiasts looking to enhance their skills and strategy on the court.

Kim & Kwon, (2017) in the Effect of Different Training Methods on the Badminton High Clear Shot, compared various training methods for improving high clear shots in badminton, concluding that a combination of strength training and technique drills yields the best results in shot height and accuracy. Lee et al (2020). focuses on the effectiveness of targeted skill training programs for young badminton players. It highlights how specific drills and techniques can improve fundamental shots, including the high clear shot. The research suggests that structured training programs significantly enhance the technical skills of players aged 8-10 years.

6. Summary

Based on the relevant research studies, it has been found that considering the developmental stage of children aged 8-10 in designing an effective training program is very important. It underscores the significance of fundamental sports skill development during this age range, aligning with the Long-Term Athlete Development (LTAD) coaching process. The review highlights the need for age-appropriate and enjoyable training to foster a love for badminton, considering the physical, mental, and social aspects of children's development. Additionally, insights from studies stress the role of multi-ball training, footwork, and specific stroke techniques in enhancing badminton skills in this age group. The literature emphasizes the holistic approach to training, encompassing physical fitness, technical skills, and psychological aspects, tailored to the unique characteristics and needs of 8-10-year-old students.

However, a badminton training program must consider the skills and age of the student to achieve the best results. Therefore, the researcher wants to design a training program to develop the badminton skills of students between the ages of 8-10 years so that the badminton skills of children at this age can be fully developed.

Conceptual Framework

The conceptual framework for this research is as follows:

1. The independent variable is the badminton high clear shot training program.
2. The dependent variables are the improvement of badminton high clear shot skills of students aged between 8-10 years.

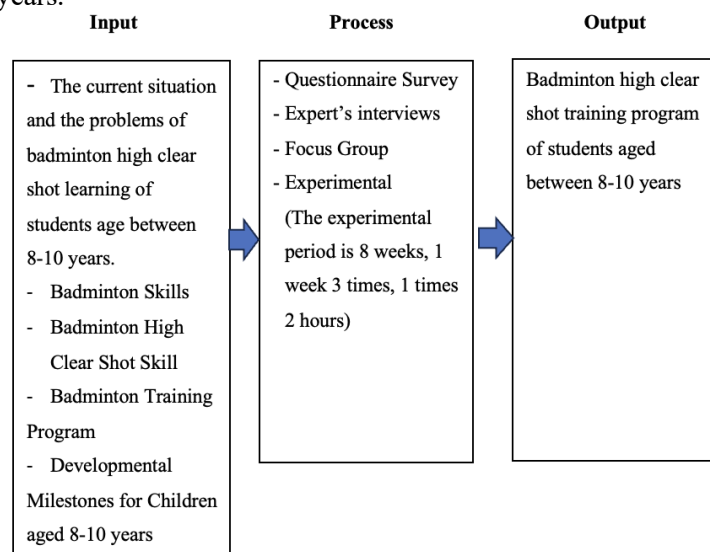


Figure 1 Conceptual framework

Methodology

Research Tools

In this research, the following tools were used to conduct the study: (1) a Questionnaire for students, (2) an Interview form for experts, (3) a Badminton High Clear Shot Training Program, (4) a Badminton High Clear Shot Test.

Population and Sample

Population specification and size: The research scope of this study is students aged between 8-10 years. 79 students aged between 8-10 years in the badminton club at Shenzhen Nanshan Foreign Languages School Dachong Primary School were selected as a population.

Sample: Through a high clear shot skill test, 30 students with low test scores who volunteered to participate in the research have been selected as the sample group.

Data Collection

1. Questionnaires were distributed to 30 students aged between 8-10 years in the badminton club at Shenzhen Nanshan Foreign Languages School Dachong Primary School, who had never received

badminton training before.

The objective of distributing the questionnaires is to understand the current situation and the problems of badminton high clear shot training of students aged between 8 and 10 years and draft the conceptual framework.

2. Evaluate the questionnaires and interview form questions by analyzing the congruence index of their content with their objectives, employing the Item-Objective Congruence (IOC) with input from 3 experts.

3. 5 experts were engaged through face-to-face interviews, to gain insights into the current situation and the problems of badminton high clear shot learning of students aged between 8-10 years. Moreover, in this step, the questions for asking the experts in the focus group will be drafted.

4. 12 experts were engaged in a focus group to develop a badminton high clear shot training program to improve the badminton high clear shot skills of students aged between 8-10 years.

5. Conduct a tryout of the newly developed badminton high clear shot training program with 5 students to assess its suitability for student use and determine whether the intensity of the training is appropriate or not.

6. The experiment will be conducted. This research will implement an 8-week training program aimed at enhancing the skill of badminton high clear shot. The testing for this skill will be conducted on three occasions: (1) before the training; (2) after 4 weeks of training; and (3) upon completion of the full 8-week training period. A comparative analysis of the test results will be conducted to assess the effectiveness of the badminton high clear shot training program.

Data Analysis

1. Descriptive statistical techniques, such as calculating the mean and standard deviation, are employed to analyze the data gathered from the questionnaire.

2. Evaluate the content validity of the questionnaire and the questions in the expert interview form by using the Indexes of Items of Objective Congruence (IOC). The IOC value for the questionnaire for students is 0.89, and the IOC value for the interview form was 0.86.

3. The expert interviews and focus group discussions were analyzed using content analysis.

4. A one-way repeated measures ANOVA was employed to examine the results of the pre-test, the test after 4 weeks of training, and the post-test following 8 weeks of training.

5. Dependent t-tests were utilized to compare within a single group by comparing: (1) the pre-test and the test results after 4 weeks of training; (2) the results after 4 weeks of training and the post-test; and (3) the pre-test and the post-test.

6. When assessing the mean score derived from expert-provided information, the researcher utilized the Likert scale to ascertain the average measure score.

The meanings of 5 scale evaluation are 1 = Very Poor, 2 = Poor, 3 = Moderate, 4 = High, 5 = Highest. The details of the score criteria are as follows:

Average score range	Meaning
1.00 - 1.79	Very Poor
1.80 - 2.59	Poor
2.60 - 3.39	Moderate
3.40 - 4.19	High
4.20 - 5.00	Highest

Results

1. Survey on the current situation and the problems of badminton high clear shot learning of students aged between 8-10 years.

The questionnaires were distributed on-site to 30 students to evaluate their current experiences and issues related to learning the high clear shot. After distributing the questionnaires to all 30 students with low scores in the high clear shot test, the completed questionnaires were collected and analyzed. The results are as follows:

Table 1 Questionnaire survey results on the current situation and the problems of badminton high clear shot learning of students aged between 8-10 years.

Questionnaire Items	Total Score		Result
	\bar{x}	S.D.	
1. How long have you been playing badminton?	2.30	0.46	Poor
2. How would you rate your current skill level in badminton?	2.40	0.49	Poor
3. How often do you practice badminton each week?	2.90	0.54	Moderate
4. How confident are you in executing the high clear shot?	2.12	1.43	Poor
5. How often do you practice the high clear shot?	2.80	0.60	Moderate
6. Do you understand the correct technique for the high clear shot?	3.10	0.54	Moderate
7. How many challenges do you face in learning the high clear shot?	4.20	0.60	Highest
8. Do you think the current school training program can help you to improve your high clear shot?	2.60	0.80	Moderate
9. Would you be interested in participating in a structured training program specifically for the high clear shot?	3.90	0.70	High
10. Do you think badminton high clear shot skill is important to improve the basic badminton skill?	4.10	0.70	High

From Table 1, the questionnaire survey results on the current situation and the problems of badminton high clear shot learning of students aged between 8-10 years showed that students still have to improve their badminton skills, this can be seen from question 2 “How would you rate your current skill level in badminton?”, the result of this question was in the “Poor” (\bar{x} , S.D. = 2.40±0.49). For badminton high clear shot skill, students do feel not confident when they are executing the high clear shot, this can be seen from question 4 “How confident are you in executing the high clear shot?”, the result of this question was in the “Poor” (\bar{x} , S.D. = 2.12±1.43). Students do not have as much understanding of the techniques for hitting high clear shots as they should, this can be seen from question 6 “Do you understand the correct technique for the high clear shot?”, the result of this question was in the “Moderate” (\bar{x} , S.D. = 3.10±0.54). In addition, while learning badminton high clear shot skills, students also encountered many obstacles and challenges in hitting high clear shots, this can be seen from question 7 “How many challenges do you face in learning the high clear shot? ”, the result of this question was in the “Highest” (\bar{x} , S.D. = 4.20±0.60).

2. Develop a badminton high clear shot training program to improve badminton high clear shot skills of students aged between 8-10 years

A focus group of 12 experts was convened to develop a badminton high clear shot training program aimed at improving the high clear shot skills of students aged 8-10 years. The developed badminton high clear shot training program will be conducted for 8 weeks, with sessions scheduled 3 days per week, 2 hours per day. To study whether the developed badminton high clear shot training program can improve badminton high clear shot skill, and whether badminton high clear shot training program is effective. The testing for badminton high clear shot skills will be conducted on three occasions: (1) before the training begins; (2) after 4 weeks of training; and (3) upon completion of the full 8-week training period.

3. The result of the badminton high clear shot skill test of students

The results of the high clear shot skill test of students before, after 4 weeks of training, and after 8 weeks of training are as follows:

Table 2 The mean and standard deviation of high clear shot skill test of students aged 8-10 years, as a sample group (n=30)

High clear shot skill test	Mean (\bar{x})	Std. Deviation (SD)
Pre-test	6.20	1.27
Week 4	9.97	2.14
Week 8	17.47	2.11

Table 2 shows the results of the high clear shot skill test for students aged between 8-10 years before training, after 4 weeks of training, and after 8 weeks of training using the developed badminton high clear shot training program. The sample group consisted of 30 students. The mean and standard deviation of the test results were as follows: before training with the developed specific training program, the results were 6.20 ± 1.27 ; after 4 weeks of training, the results were 9.97 ± 2.14 ; and after 8 weeks of training, the results were 17.47 ± 2.11 .

Table 3 Comparative results of high clear shot skill test results before, after 4 weeks of training, and after 8 weeks of training with the developed badminton training program by using One-way repeated measures ANOVA

Source of Variance	SS	Df	MS	F	Sig.
(Sov)					
Between Group	1973.76	2	986.88	960.74*	.00
Within Group	59.58	57	1.03		
Total	2033.34	59	987.91		

* $P < .05$

Table 3, shows the results of the high clear shot skill test before training, after 4 weeks of training, and after 8 weeks of training using the developed badminton high clear shot training program. The analysis revealed a statistically significant improvement in the high clear shot skill of students aged between 8-10 years in the sample group between the pre-training, post-4-week training, and post-8-week training assessments [$F_{(2,57)} = 960.74$, sig. = .000].

Table 4 Comparative results of high clear shot skill test results of students between before and after 4 weeks of training

Period	Mean (\bar{x})	Standard Deviation (SD)	t	P
Before Training	6.20	1.27	26.73*	0.00
After 4 Weeks of Training	9.97	2.14		

* $P < .05$

From Table 4, the results of comparing the high clear shot skill test results of students aged between 8-10 years, between before and after 4 weeks of training with the developed badminton high clear shot training program showed a statistically significant difference at the 0.05 level.

Table 5 Comparative results of high clear shot skill test results of students between before and after 8 weeks of training

Period	Mean (\bar{x})	Standard Deviation (SD)	t	P
Before Training	6.20	1.27	45.28*	0.00
After 8 Weeks of Training	17.47	2.11		

* $P < .05$

From Table 5, the results of comparing the high clear shot skill test results of students aged between 8-10 years before and after 8 weeks of training with the developed badminton high clear shot training program showed a statistically significant difference at the 0.05 level.

Table 6 Comparative results of high clear shot skill test results of students between after 4 weeks of training and after 8 weeks of training

Period	Mean (\bar{x})	Standard Deviation (SD)	t	P
After 4 Weeks of Training	9.97	2.14	25.49*	0.00
After 8 Weeks of Training	17.47	2.11		

* $P < .05$

From Table 6, the results of comparing the high clear shot skill test results of students aged between 8-10 years between 4 weeks and after 8 weeks of training with the developed badminton high clear shot training program showed a statistically significant difference at the 0.05 level.

Summary

After 8 weeks of training, it was found that the students showed significant improvement in their badminton high clear shot skills. This indicates that the developed training program is effective in enhancing high clear shot skills among students aged between 8-10 years and can be utilized in the development of badminton education at the primary school level. The program not only improves students' badminton skills but also increases their interest in learning badminton.

Conclusion

The result showed that after 8 weeks of training with a developed badminton high clear shot training program, there was a statistically significant improvement in the high clear shot skill of students, between before training with the developed badminton training program, before, after completing the training in Week 4, and Week 8 [$F_{(2,57)} = 960.74$, sig. = .000].

Discussion

After the 8-week training period using the developed badminton high clear shot training program, the high clear shot skill of students in the sample group showed significant improvement. This is evident from the significant differences in the results of the pre-test, the test after 4 weeks of training, and the test after 8 weeks of training. These findings are consistent with the research conducted by Ankit & Verma, (2019) which indicated that the effectiveness of various training methods on high clear shot performance in badminton was assessed. The results show that combining drill practice with match play significantly improves the execution of high clear shots among intermediate players.

In addition, training badminton for students aged 8-10 years shows that children develop well and can quickly improve their skills. This is evident from the results of the tests conducted before and after the 8-week training, which reveal a significant difference. This improvement is attributed to the fact that children in this age group are eager to learn and can acquire new skills rapidly. These findings are consistent with the research of Canadian Sport Centres (2016) which indicated that studying



badminton training for students aged 8-18 is highly important and offers numerous benefits. This age range is a critical period for skill development and rapid learning. Analyzing their progress in badminton skills provides valuable insights that can guide the development of training programs aimed at further enhancing their abilities in the future.

Moreover, it can be seen that practicing high clear shot skill is a basic skill, suitable for use with beginners, as the researcher used it to train students aged 8-10 years who have beginner badminton skills. The results of the experiment show that students with beginner skills can practice high clear shot skills well, with good development, and it is not too difficult. These findings are consistent with the research of Smith (2019) mastering the high clear shot delves into the crucial techniques for executing a high clear shot in badminton, a fundamental skill for players at all levels. Drawing on insights from professional coaches and players, the author offers detailed guidance on grip, stance, backswing, execution, follow-through, footwork, and timing. The article also provides practical tips for improving consistency and accuracy, along with common mistakes to avoid. Featuring clear illustrations and examples, this resource is invaluable for badminton enthusiasts aiming to refine their skills and strategy on the court.

Therefore, the results of this research showed that the badminton high clear shot training program developed by the researcher can improve the high clear shot skill of students aged between 8-10 years.

Recommendation

Recommendation for current research

1. Conduct a thorough analysis of the current skill levels and training needs of students aged 8-10. This can involve assessments of their existing high clear shot techniques, common challenges they face, and their general understanding of the game.
2. Extend the research to include a broader age range to determine how training needs and effectiveness might vary between different developmental stages. This could provide insights into how to adjust training programs for other age groups.
3. Investigate the psychological aspects of learning and performance, such as confidence, motivation, and anxiety, and their impact on skill development. Integrate strategies to address these factors within the training program.

Recommendation for further research

1. Compare the effectiveness of the developed training program with other existing programs or traditional methods. This can help identify strengths and areas for improvement in your program.
2. Investigate the use of emerging technologies, such as virtual reality (VR) or augmented reality (AR), in enhancing the training program. Assess how these technologies can improve learning outcomes and engagement.
3. Conduct long-term studies to evaluate the sustained impact of the training program on skill development and retention. Assess how well students maintain and improve their high clear shot skills over time.

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