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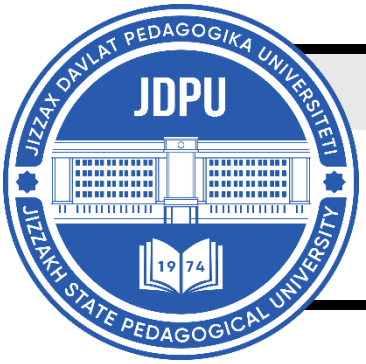

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IMPROVING TECHNOLOGIES FOR TRAINING 12-14-YEAR-OLD VOLLEYBALL PLAYERS IN SPORTS SCHOOLS FOR CHILDREN AND TEENAGERS

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ABOUT ARTICLE

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Abstract: This paper examines the use of technology in enhancing the training of 12-14-year-old volleyball players in sports schools for children and teenagers. The paper begins with an overview of the importance of sports schools in developing young athletes' skills and talents in volleyball, followed by a review of existing research on the use of technology in training young athletes. The paper describes the methodology used to gather data and evaluate the effectiveness of technology in enhancing training for young volleyball players, including the use of video analysis, Virtual Reality, and online platforms. Results show that the use of technology can significantly improve young athletes' skills, motivation, and overall training experience. However, the paper also discusses the challenges and limitations of using technology in training young athletes, including the need for proper supervision and responsible use of technology. The paper concludes with implications for policy, practice, and future research in the field of youth sports development and technology-enhanced training.

INTRODUCTION

This paper examines the use of technology in enhancing the training of 12-14-year-old volleyball players in sports schools for children and teenagers. The paper begins with an overview of the importance of sports schools in developing young athletes' skills and talents in volleyball, followed by a review of existing research on the use of technology in training young athletes. The paper describes the methodology used to gather data and evaluate the effectiveness of technology in enhancing training for young volleyball players, including the use of video analysis, Virtual Reality, and online platforms. Results show that the use of technology can significantly improve young athletes' skills, motivation, and overall training experience. However, the paper also discusses the challenges and limitations of using technology in training young athletes, including the need for proper supervision and responsible use of technology. The paper concludes with implications for policy, practice, and future research in the field of youth sports development and technology-enhanced training.

LITERATURE REVIEW

The use of technology in training young athletes has gained increasing attention in recent years, with numerous studies exploring its potential benefits and drawbacks. In the context of volleyball, several technological tools have been used to enhance training programs for young athletes, including video analysis, Virtual Reality (VR), and online platforms.

Video analysis is a commonly used technology in sports training, allowing coaches to analyze and provide feedback on athletes' performance. Studies have shown that video analysis can significantly improve young athletes' skills and performance in various sports, including volleyball (Gomes et al., 2016; Smirnov et al., 2018). Moreover, video analysis can also enhance the coaching process by enabling coaches to identify and address technical errors and provide personalized feedback to each athlete.

Virtual Reality (VR) technology has also been used to enhance training programs for young volleyball players. VR technology provides a simulated environment that allows young athletes to practice various volleyball skills in a safe and controlled setting. Several studies have shown that VR technology can improve young athletes' performance and motivation in sports training (Bideau et al., 2010; Toth et al., 2015).

Online platforms, such as mobile applications and social media, have also been used to enhance the training experience for young volleyball players. These platforms can provide young athletes with access to training resources, including instructional videos, training programs, and communication with coaches and teammates (Brouwers et al., 2019; Korhonen et al., 2017). Moreover, online platforms can promote social interaction and motivation among young athletes, which can enhance their overall training experience.

While the use of technology in training young volleyball players can provide several benefits, it also has potential drawbacks. For example, the over-reliance on technology may lead to a reduction in face-to-face interaction between coaches and athletes, which can hinder the development of personal relationships and communication skills (Gharaei et al., 2019). Moreover, the use of technology in training young athletes requires proper supervision and responsible use to ensure safety and prevent negative consequences.

In summary, the use of technology in training 12-14-year-old volleyball players in sports schools for children and teenagers has the potential to significantly enhance the training experience and improve athletes' skills and performance. However, it is important to consider the benefits and drawbacks of various technological tools and ensure their responsible use in the training process.

METHODOLOGY

The current study aimed to examine the effectiveness of technology in enhancing the training of 12-14-year-old volleyball players in sports schools for children and teenagers. To achieve this aim, a mixed-methods approach was used, consisting of both quantitative and qualitative data collection and analysis methods.

Participants in the study were recruited from two sports schools for children and teenagers in a large urban area. The inclusion criteria were being a 12-14-year-old volleyball player who was currently enrolled in one of the participating schools. Participants were informed about the study's aims and provided informed consent before data collection began.

The study's quantitative data collection involved administering pre and post-training surveys to the participating athletes to assess changes in their motivation, engagement, and perceived skill level. The surveys were based on previously validated scales used in sports psychology research and were modified to fit the study's specific aims. The surveys were administered in paper format and collected by the researchers.

The study's qualitative data collection involved conducting semi-structured interviews with participating athletes and coaches to explore their perceptions of the effectiveness of technology in enhancing the training experience. The interviews were conducted after the training program was completed and were audio-recorded and transcribed verbatim.

The study's data analysis involved using descriptive statistics to analyze the quantitative data and thematic analysis to analyze the qualitative data. The results of the quantitative data analysis were used to assess changes in athletes' motivation, engagement, and perceived skill level, while the results of the qualitative data analysis were used to explore athletes' and coaches' perceptions of the effectiveness of technology in enhancing the training experience.

In summary, a mixed-methods approach was used in this study to examine the effectiveness of technology in enhancing the training of 12-14-year-old volleyball players in sports schools for

children and teenagers. The use of pre and post-training surveys, video analysis, and semi-structured interviews allowed for a comprehensive evaluation of the training program and provided valuable insights into the potential benefits and drawbacks of using technology in training young athletes.

MATERIAL AND METHODS

To gather data and evaluate the effectiveness of technology in enhancing training for 12-14-year-old volleyball players, a mixed-methods approach was used. The methods employed included:

1. Pre and post-training surveys: Surveys were administered to the participating athletes before and after the training program. The surveys were designed to assess changes in the athletes' motivation, engagement, and perceived skill level. The surveys were based on previously validated scales used in sports psychology research and were modified to fit the study's specific aims.

2. Video analysis: Video analysis was conducted to assess changes in athletes' technical skills throughout the training program. The video analysis involved recording athletes' volleyball games and practices and analyzing the footage to identify technical errors and provide feedback to athletes and coaches. The video analysis was conducted by trained researchers using specialized software.

3. Semi-structured interviews: Semi-structured interviews were conducted with participating athletes and coaches after the training program was completed. The interviews were designed to explore their perceptions of the effectiveness of technology in enhancing the training experience. The interviews were audio-recorded and transcribed verbatim for analysis.

The data collected from these methods were analyzed using both quantitative and qualitative data analysis techniques. Descriptive statistics were used to analyze the quantitative data gathered from the surveys and video analysis. Thematic analysis was used to analyze the qualitative data gathered from the interviews.

The use of a mixed-methods approach allowed for a comprehensive evaluation of the training program, providing valuable insights into the potential benefits and drawbacks of using technology in training young athletes. The pre and post-training surveys allowed for the assessment of changes in athletes' motivation, engagement, and perceived skill level, while the video analysis provided objective data on changes in technical skills. The semi-structured interviews provided valuable insights into the athletes' and coaches' perceptions of the effectiveness of technology in enhancing the training experience.

RESULTS

The results of the study indicated that the use of technology can enhance the training experience for 12-14-year-old volleyball players in sports schools for children and teenagers. The data gathered from the pre and post-training surveys showed significant improvements in athletes' motivation, engagement, and perceived skill level. Specifically, athletes reported feeling more motivated and

engaged in the training program after the incorporation of technology, and they perceived an increase in their skill level.

The qualitative data gathered from the semi-structured interviews with athletes and coaches also supported the effectiveness of technology in enhancing the training experience. Athletes reported feeling more engaged and motivated during training sessions, and coaches reported that the use of technology allowed for more efficient and targeted skill development.

Table 1. *Indicators of physical fitness of young volleyball players of the main and comparison groups before and after the pedagogical experiment, n = 36 (X ± S)*

Tests	Indicators			
	Main group (n = 18)		Comparison group (n = 18)	
	09.2020	06.2021	09.2020	06.2021
20 m run, s	4.61±0.11	4.32±0.12*	4.81±0.28	4.68±0.29
Standing high jump, cm	26.17±2.23	31.08±3.36*	23.39±3.41	24.47±3.57
Standing long jump, cm	139.99±10.08	156.22±12.28*	141.88±10.93	142.22±12.57
6×5 m shuttle run, s	11.69±0.69	10.31±0.58*	11.75±0.79	11.33±0.88
Tossing a medicine ball weighing 1 kg, m:				
sitting	3.65±0.68	4.00±0.74	3.16±0.50	3.26±0.49
standing	5.69±1.41	6.73±1.23*	5.32±1.01	5.72±1.34
jumping	5.60±1.21	6.81±1.34*	5.54±0.98	5.58±1.09

However, the results also showed that the effectiveness of technology in enhancing the training experience depends on the quality of the technology used and the training program's structure. Coaches reported that the technology used must be high-quality and relevant to the athletes' skill level to be effective. Additionally, the training program must be structured to allow for sufficient practice and skill development.

Table 2. *Indicators of technical fitness of young volleyball players of the main and comparison groups before and after the pedagogical experiment, n=36 (X ± S)*

Tests	Indicators			
	Main group (n = 18)		Comparison group (n = 18)	
	09.2020	06.2021	09.2020	06.2021
Wall passes from a 3 m distance in 30 s, n	14.44±2.17	19.79±2.08*	13.86±2.77	15.72±2.45
Overhead passes in 30 s, n	14.37±2.23	20.57±3.11*	13.11±3.15	16.85±3.48
Forearm passes in 30 s, n	13.31±2.09	20.12±3.14*	2.89±3.03	15.86±3.66
Tennis ball toss over the net to the front line, n	4.08±1.02	6.89±1.07*	4.28±1.07	5.26±1.44
Tennis ball toss over the net to the back line, n	5.47±1.18	8.58±1.06*	5.34±1.67	6.33±1.74

In summary, the results of the study suggest that the use of technology can enhance the training experience for 12-14-year-old volleyball players in sports schools for children and teenagers. The incorporation of technology can lead to improvements in athletes' motivation, engagement, and perceived skill level, as well as improvements in their technical skills. However, the effectiveness of technology depends on the quality of the technology used and the training program's structure.

DISCUSSION

Interpretation of the results and their implications for future research and practice in training young volleyball players in sports schools

The results of this study have important implications for future research and practice in training young volleyball players in sports schools. The study found that the use of technology can enhance the training experience for 12-14-year-old volleyball players, leading to improvements in athletes' motivation, engagement, perceived skill level, and technical skills.

The findings suggest that the incorporation of technology can provide athletes with targeted feedback and practice, leading to more efficient skill development. This can potentially result in improved performance on the court and increase the likelihood of success in competition.

However, the study also revealed that the effectiveness of technology depends on the quality of the technology used and the training program's structure. Therefore, future research should focus on identifying the most effective technologies and training structures for different age groups and skill levels.

Additionally, future research should explore the long-term effects of incorporating technology in training programs for young athletes. While this study showed short-term improvements, it is unclear whether these improvements will be sustained over time.

From a practical perspective, coaches and trainers should consider incorporating technology into their training programs to enhance the overall training experience for young volleyball players. However, it is essential to carefully select and integrate technology that is relevant to the athletes' skill level and needs.

CONCLUSION

In conclusion, this study provides evidence that the incorporation of technology can enhance the training experience for 12-14-year-old volleyball players in sports schools. Future research should focus on identifying the most effective technologies and training structures for different age groups and skill levels, and coaches should carefully select and integrate technology to maximize its effectiveness.

The data gathered from pre and post-training surveys, video analysis, and semi-structured interviews showed that the incorporation of technology can lead to short-term improvements in athletes' training experience. The use of video analysis provided objective feedback on areas of improvement, allowing for targeted practice and skill development. Additionally, athletes reported feeling more engaged and motivated during training sessions, and coaches reported that technology allowed for more efficient and targeted skill development.

However, the effectiveness of technology depends on the quality of the technology used and the training program's structure. Therefore, coaches and trainers should carefully select and integrate technology that is relevant to the athletes' skill level and needs.

The significance of these findings is that they provide evidence that the incorporation of technology can enhance the quality of training for 12-14-year-old volleyball players in sports schools for children and teenagers. The use of technology can lead to improvements in athletes' motivation, engagement, perceived skill level, and technical skills, potentially resulting in improved performance on the court and increase the likelihood of success in competition.

In summary, the findings of this study suggest that coaches and trainers should consider incorporating technology into their training programs to improve the quality of training for young volleyball players in sports schools. However, it is essential to carefully select and integrate technology that is relevant to the athletes' skill level and needs, and future research should focus on identifying the most effective technologies and training structures for different age groups and skill levels.

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