

Technological Training Tools in Teaching Physical Education Among Martial Arts Athletes



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ABSTRACT: This study intends to investigate the technological training tool used in the teaching of martial arts athletes in physical education classes. It will investigate the effect of virtual training tools, online coaching platforms, and collaborative software on athlete performance, motivation, and engagement in martial arts training. This study intends to contribute to the understanding of how technology can be utilized to increase athletic performance and expand access to sports training by examining the effects of technology on martial arts training. Findings indicate that martial arts instruction is an essential component of physical education curricula, since it provides learners with numerous benefits, including physical health, cognitive development, emotional control, and social skills. In addition, technological tools have made martial arts instruction more accessible and interesting to students.

KEYWORDS: Physical education, Martial arts, Technological Tools, ICT Training Tools

I. INTRODUCTION

Physical education is essential for maintaining the good health and well-being of every student. Sports like Martial Arts offer a unique combination of physical, mental, and emotional benefits. Martial Arts training as a physical education activity requires physical fitness, physical fitness, mental focus, emotional regulation, and social skill (Theeboom et al., 1999). However, traditional Martial Arts training methods often rely on in-person instruction and hands-on coaching, which can limit accessibility for some individuals and groups.

Martial Arts training requires physical fitness, discipline, and focus, and can also promote self-confidence and stress relief (Holt, 2017). However, traditional Martial Arts training methods often rely on in-person instruction and hands-on coaching, which can limit accessibility for some individuals and groups.

Recent advancements in technology, including virtual training tools, online coaching platforms, and collaborative software, have the potential to expand the reach of Martial Arts training and provide new opportunities for athletes to improve their skills and performance (Sperlich et al., 2020). By incorporating technology into Martial Arts training, athletes may be able to access training materials and coaching from anywhere, connect with other athletes and coaches remotely, and receive real-time feedback and analysis of their technique and performance.

This study aims to investigate the technological training tools used in teaching physical education among martial arts athletes. Specifically, the study will examine the impact of virtual training tools, online coaching platforms, and collaborative software on athlete performance, motivation, and engagement in Martial Arts training. By investigating the effects of technology on Martial Arts training, this study aims to contribute to the understanding of how technology can be used to enhance athletic performance and improve access to sports training.

This study intends to contribute to the understanding of how technology can be utilized to increase athletic performance and expand access to sports training by examining the effects of technology on martial arts training. Therefore, this research can inform the creation of new technology tools and training programs for Martial Arts athletes, as well as shed light on the larger implications of technology for sports training and performance.

II. METHODOLOGY

This study utilized a systematic review as its methodology. Specifically, the study focused on searching for literature and studies that provide information on the importance of Martial Arts as a PE program and the technological training tools for Martial Arts. According to Higgins et al. (2019), a systematic review employs a thorough and rigorous methodology to locate, evaluate, and synthesize all relevant data pertaining to a certain research issue or topic. It is a systematic and unbiased process for assembling the strongest evidence from multiple studies, and it can help guide decisions in education, healthcare, social science, and other fields. Thus, it utilized the process of defining the research problem, developing a search strategy, screening, filtering, and evaluating studies based on the problem, synthesizing and reporting the findings.

III. DISCUSSION

1. Importance of Martial Arts Training as Physical Education Program

Martial arts training in physical education (PE) programs is gaining acceptance worldwide due to its potential health benefits and positive impact on cognitive and emotional development (Fong et al., 2017). Martial arts are frequently taught in schools as a required subject for physical education in China.

Theeboom et al. (1999) claimed that Asian Martial Arts improves students' physical health, mental attention, emotional management, and social abilities. AMA lessons improved students' self-esteem, self-regulation, and physical fitness, including strength, flexibility, and endurance. Traditional and modern teaching methods can affect student motivation and involvement. In general, it is highlighted that including Martial Arts in physical education programs can bring considerable benefits to students and need to be viewed as a vital component of physical education curricula. This is because Martial Arts can help students develop important life skills, like self-discipline, focus, and self-defense.

It has been found that martial arts training has a beneficial effect on learners with developmental disabilities. Research has demonstrated that martial arts training can increase cognitive abilities such as sustained attention span and reaction time, which are crucial in many contexts. For example, a study conducted by Johnstone and Marí-Beffa (2018) found that martial arts training improved attentional control in adults. Similarly, Bu et al. (2018) revealed in an extensive assessment that martial arts training can improve cognitive processes such as attention and other functions. Tai Chi can benefit children's general health and well-being by enhancing their balance and functional mobility, and other essential aspects of physical fitness (Cetin, Erel, & Bas Aslan, 2019). Kim et al., (2018) mentioned that Taekwondo training has a positive effect on self-esteem, self-efficacy, and social support. It is likewise known to reduce anxiety and aggression. The study also suggests that the psychosocial benefits of Taekwondo training are consistent across age, gender, and cultural backgrounds. Generally, the study provides evidence that Taekwondo instruction improves psychosocial well-being of individuals.

2. Technology Training Tools for Martial Arts Athletes

Due to the opportunities it offers for students and teachers to collaborate and interact in novel ways, collaborative technology has become more common in the teaching of martial arts and physical education. According to Zhu (2020), information and communication technology (ICT) can be utilized to improve the teaching and learning of martial arts by delivering content that is more interactive and engaging, in addition to tailored feedback and evaluation. As suggested, students of martial arts be given access to a wider variety of information and communication technology (ICT) tools, such as video tutorials, online learning platforms, virtual reality simulations, and mobile applications, in order to facilitate a more adaptable and engaging educational setting.

Pu and Yang (2021) discusses the application of virtual reality (VR) technology in martial arts teaching. It highlights the potential benefits of using VR, such as providing a safe and controlled environment for students to practice techniques, increasing engagement and motivation, and improving learning outcomes. VR technology can be used to give students immediate feedback on the athletes' performance, such as how they stand, move their feet, or time their moves. This feedback can be based on objective measurements, like the angle of a student's arm or leg, or on more subjective assessments, like their overall form or balance. VR technology could also be used to make personalized training programs for students based on their skill level, interests, and goals. This allows teachers to be more flexible and adaptable in terms of strategies. In a similar way, it also makes students more interested and motivated to train and be proactive learners.

The application of artificial intelligence and big data analysis in martial arts training has the potential to enhance the efficiency and safety of training routines, as well as our understanding of martial arts as a sport and form of physical exercise (Han et al., 2020). In addition, student achievement, learning style, and preferences, the AI model may create customized learning plans (Ye, 2020). The model can also discover educational gaps and recommend improvements. Real-time performance feedback and recommendations for students and teachers can improve martial arts instruction .

Films, audios, and graphics boost martial arts learning. Multimedia technology motivates, stimulates, and enables martial arts students to learn complex moves and techniques. Videos and audios describe martial arts moves. Martial arts students can learn through 3D animations. Study suggests teaching martial arts through mobile apps, VR, and AR. Multimedia technology helps martial arts trainers teach. Videos, audios, photos, and other multimedia materials can assist martial arts students learn, motivate, and master complex abilities. (Cui, 2019)

Sun (2020) notes that multimedia technology can be used to demonstrate taekwondo methods and moves and give interactive tutorials for practice. Online learning platforms for taekwondo can be created using multimedia technologies. Multimedia technology simulates real-world taekwondo scenarios and provides a virtual training environment. This lets students practice in a secure, controlled environment and receive immediate feedback. Multimedia technology may motivate, engage, and improve taekwondo skills. In addition, Taekwondo instructors use CAI (Computer-Assisted Instruction) courseware. The goal is to teach students Taekwondo action technology and fundamentals. CAI courseware uses visuals to clearly communicate educational objectives and information. Multimedia, including graphics, animation, audio, and video, helps pupils understand and master Taekwondo technology. Taekwondo can be taught methodically using computer multimedia. Students can learn selectively by

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clicking between courseware sections. CAI courseware helps students build self-learning skills and master Taekwondo methods and philosophies.

Wang (2019) includes the following examples of martial arts technology:

- 1.) Video Analysis Software: This software enables coaches and athletes to enhance their technique by viewing training and competition recordings;
- 2.) Virtual Training Equipment: VR technology can replicate realistic training environments and provide a safe place for athletes to practice techniques and sparring without risk of injury.
- 3.) Online Coaching Platforms: These platforms enable athletes to receive remote tutoring and feedback from coaches and industry professionals;
- 4.) Wearable Technology: Smartwatches and fitness trackers can monitor an athlete's heart rate, activity, and other performance-enhancing characteristics.
- 5.) Collaboration Software: Online whiteboards and communication tools allow athletes and coaches to function remotely.

IV. CONCLUSION

The influence that new technology has on the practice and teaching of martial arts is a field of study that is experiencing significant expansion through the years. The studies that were considered for this review provide evidence that the use of technology into martial arts instruction has the potential to enhance both the quality and the efficacy of such instruction. It has been established that martial arts training provides several benefits for individuals, including physical, cognitive, and psychological growth. New and innovative pedagogical practices can improve student motivation and engagement. Hence, the incorporation of martial arts in physical education curricula can provide students with significant benefits. Meanwhile, the implementation of technology in martial arts training, such as virtual reality, multimedia, and artificial intelligence, has the potential to improve the efficacy and safety of training routines, as well as providing students with an interesting and customizable learning environment. The combination of martial arts with technology can result in a more comprehensive and efficient learning environment, fostering a lifetime interest in physical activity and personal development. To fully investigate the possibilities presented by the incorporation of technology into martial arts instruction, additional research is required.

REFERENCES

- 1) Bu, B., Haijun, H., Yong, L., Chaohui, Z., Xiaoyuan, Y., & Fiatarone Singh, M. (2018). Effects of martial arts on health status: A systematic review. *Journal of Evidence-Based Medicine*, 11(3), 143-154. doi: 10.1111/jebm.12316
- 2) Cui, B. (2019). Analysis of Application of Multimedia Technology in Martial Arts Teaching. 2019 International Conference on Information Science, Engineering and Education Technology (ISEET), 25-28. doi: 10.1109/ISEET.2019.00064
- 3) Cetin, S. Y., Erel, S., & Aslan, U. B. (2019). The effect of Tai Chi on balance and functional mobility in children with congenital sensorineural hearing loss. *International Journal of Pediatric Otorhinolaryngology*, 125, 21-25. doi: 10.1016/j.ijporl.2019.05.013
- 4) Prasertsakul, T., Kaimuk, P., Chinjenpradit, W., Limroongreungrat, W., & Charoensuk, W. (2019). The effect of virtual reality-based balance training on motor learning and postural control in healthy adults: A randomized preliminary study. *Journal of Physical Therapy Science*, 31(11), 897-902. doi: 10.1589/jpts.31.897
- 5) Han, Q., Huo, S., & Li, R. (2020). Martial Arts Routine Training Method Based on Artificial Intelligence and Big Data of Lactate Measurement. *Frontiers in Physiology*, 11, 582640. doi: 10.3389/fphys.2020.582640
- 6) Higgins, J. P., & Green, S. (Eds.). (2011). *Cochrane handbook for systematic reviews of interventions*. John Wiley & Sons.
- 7) Holt, N. L. (2017). Positive youth development through sport: A review and critique of the literature. In D. Hackfort & R. J. Schinke (Eds.), *The Routledge international handbook of sport psychology* (pp. 533-547). Routledge.
- 8) Kim, Y.-J., Baek, S.-H., Park, J.-B., Choi, S.-H., Lee, J.-D., & Nam, S.-S. (2018). The Psychosocial Effects of Taekwondo Training: A Meta-Analysis. *International Journal of Environmental Research and Public Health*, 15(12), 2657. doi: 10.3390/ijerph15122657.
- 9) Johnstone, A., & Mari-Beffa, P. (2018). The Effects of Martial Arts Training on Attentional Networks in Typical Adults. *Frontiers in psychology*, 9, 2059.
- 10) Pu, Y., & Yang, Y. (2021). Application of Virtual Reality Technology in Martial Arts Situational Teaching. *Journal of Physics: Conference Series*, 1927(1), 012048. doi: <https://doi.org/10.1155/2022/6497310>
- 11) Sperlich, B., & Holmberg, H.-C. (2017). The responses of elite athletes to exercise: An all-day, 24-h integrative view is required! *Frontiers in Physiology*, 8, 564. doi: 10.3389/fphys.2017.00564
- 12) Sun, J. (2020). Application of Computer Multimedia Technology in Taekwondo Teaching. *Journal of Physics: Conference Series*, 1648, 022107. doi: 10.1088/1742-6596/1648/2/022107

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- 13) Theeboom, M., De Knop, P., & Weiss, M. R. (1999). Asian Martial Arts and Approaches of Instruction in Physical Education. *European Journal of Physical Education*, 4(2), 147-169. <https://doi.org/10.1080/1740898990040204>
- 14) Wang, Y., (2019), Martial Arts Teaching Reform and Innovation in Colleges and Universities under the Background of "Internet +". CSP: 2019 International Conference on Humanities, Management Engineering and Education Technology (HMEET 2019).
- 15) Ye, W., Li, S., Liu, S., & Zhou, Y. (2020). Application of Artificial Intelligence Technology in Martial Arts Education Governance. *Journal of Physics: Conference Series*, 1647(4), 042005. doi: <https://doi.org/10.1155/2022/5606280>.
- 16) Zhu, K. (2020). Study on Martial Arts Teaching System Reform Based on ICT Method. *Journal of Physics: Conference Series*, 1562, 012064. doi: [10.1088/1742-6596/1562/1/012064](https://doi.org/10.1088/1742-6596/1562/1/012064)



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