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IMPROVING THE EFFECTIVENESS OF TECHNICAL TRAINING IN 10–12-YEAR-OLD TENNIS PLAYERS USING ALTERNATIVE PEDAGOGICAL METHODS

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Abstract This study investigates the effectiveness of alternative pedagogical methods aimed at improving technical training in 10–12-year-old tennis players. Unlike traditional repetitive drill-based approaches, the proposed methodology integrates differential learning, variable practice, and game-based constraints. The research evaluates technical accuracy, stroke consistency, motor adaptability, and error reduction. A controlled pedagogical experiment demonstrates that alternative training methods significantly enhance technical performance and motor learning efficiency in young tennis players.

Keywords:youth tennis, technical training, differential learning, variable practice, motor skills, pedagogy.

Introduction Modern tennis requires early development of technically efficient and adaptable players. The ages of 10–12 represent a sensitive period for motor learning due to heightened neuroplasticity and coordination development. Traditional training models often rely on repetitive, standardized drills, which may limit motor adaptability and long-term skill retention.

Recent sport science research emphasizes the importance of variability, contextual interference, and self-organization in skill acquisition. Therefore, exploring alternative methodologies that foster adaptive motor learning is essential for long-term athlete development in tennis.

Purpose and Objectives of the Study

The purpose of this study is to scientifically substantiate an alternative methodology for improving technical training efficiency in 10–12-year-old tennis players.

The objectives of the study were:

1. To identify key indicators of technical performance in young tennis players;
2. To develop an alternative training methodology based on differential and variable practice;
3. To evaluate the effectiveness of the methodology through a pedagogical experiment;
4. To provide practical recommendations for youth tennis coaching.

Methods The study employed the following research methods: literature review, pedagogical observation, pedagogical experiment, technical performance testing, and statistical analysis.

Participants included 24 tennis players aged 10–12, divided into an experimental group (n=12) and a control group (n=12). The experimental group trained using alternative methods emphasizing

movement variability, constraint-led drills, and decision-making tasks. The control group followed a conventional training program.

Experimental Design

The pedagogical experiment lasted 10 weeks. Training sessions were conducted four times per week. The alternative methodology incorporated:

- Differential learning (intentional movement variations);

- Variable practice conditions (changing ball speed, trajectory, and court zones);

- Small-sided games and task constraints;

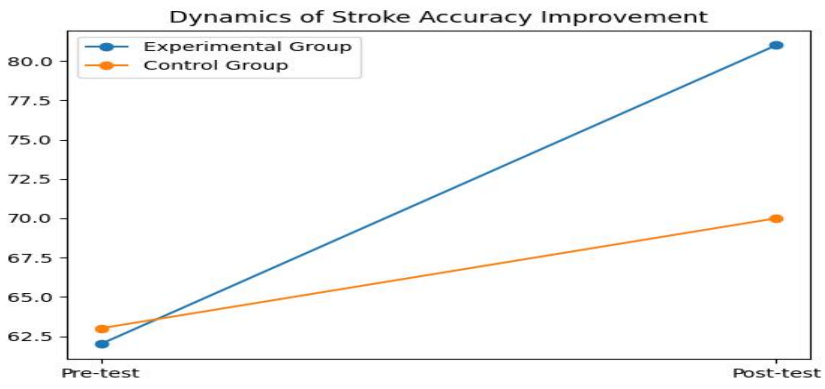
- Reduced coach feedback to encourage self-regulation.

Results The analysis of technical performance indicators revealed significant improvements in the experimental group compared to the control group.

Table 1. Changes in technical performance indicators

Indicator	Group	Pre-test	Post-test	Improvement (%)
Stroke accuracy (%)	Experimental	62	81	31
Stroke accuracy (%)	Control	63	70	11
Stroke consistency (rallies)	Experimental	8	17	113
Stroke consistency (rallies)	Control	9	12	33

Figure 1. Changes in stroke accuracy in experimental and control groups



Discussion The findings confirm that alternative pedagogical methods significantly enhance technical training outcomes. Differential learning and variable practice stimulated adaptive motor responses and improved movement efficiency. Young players demonstrated greater autonomy, decision-making ability, and technical stability under variable conditions.

These results align with contemporary motor learning theories emphasizing self-organization and variability. Compared to traditional repetitive drills, the alternative approach promotes deeper learning and long-term skill retention.

Conclusion

1. Alternative pedagogical methods are highly effective for improving technical training in 10–12-year-old tennis players

2. Differential and variable practice enhances stroke accuracy, consistency, and adaptability

3. The proposed methodology is recommended for implementation in youth tennis development programs.

4. Future research should explore long-term effects and transferability to competitive performance.

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