


Perceptual and Motor Skills

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Abstract

Our study aimed to improve the lower limbs' simple and choice reaction times and reactive spatial orientation by practicing an experimental program using Fitlight technology in U14 and U16 junior basketball players. This research integrates three specific tests: the Lower Limb Reaction Test, the Lower Limb Choice Reaction Test, and the Spatial Orientation Reactive Test. These were designed to measure and improve players' reactions to simple, choice, and spatial orientation through visual stimuli. An 18-week training program was implemented between the initial and final evaluation, emphasizing integrating basketball-specific technical and physical exercises using Fitlight technology. The subjects' sample consists of an experimental and control group with identical numbers of participants in both the U14 (18 subjects) and U16 (17 subjects) categories. SPSS was used for statistical analysis. The results indicate significant improvements with $p < .05$, Cohen's d parameters with very high effect sizes ($d > 1$), in reaction times and spatial orientation for the experimental groups, highlighting the effectiveness of incorporating modern equipment in the sports training program. Analyzing the results

of the experimental groups, we find that the most relevant age for the reactive development of spatial orientation with the help of Fitlight technologies implemented in the training process is U14, while the most relevant age for the reactive time of the lower limbs is U16. The study's results highlight the experimental program's positive impact in improving reactive reaction time in the lower limbs and spatial orientation of junior basketball players.



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Data availability statement

The datasets generated during and/or analyzed during the current study are available from the corresponding author upon reasonable request. [*](#)

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