

Attention, Cognitive Flexibility, and Spatial Skills Across Online and Offline Gameplay

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Abstract

Games have historically provided more than just entertainment, presenting chances to develop cognitive and mental abilities. This research investigates the impact of games in both online and offline formats, specifically chess, a strategic board game played in turns; football, a team sport; and FIFA, a fast-moving football simulation video game, on three cognitive skills: attention, cognitive flexibility, and spatial awareness. A targeted sample of 70 participants, consisting of teenagers, young adults, and adults with a minimum of four months of gaming experience, was conducted. Data were collected using a structured questionnaire composed of three validated scales: an adapted Attention subscale (ATTC), the Cognitive Flexibility Inventory, and the Spatial Ability Instrument. Statistical analysis was conducted using independent samples t-tests, one-way ANOVA, and Pearson's correlation coefficient. The results indicated that virtual chess players achieved significantly higher scores on measures of attention, reinforcing the role of strategy-based, turn-taking games on improving sustained focus. In comparison, FIFA players exhibited superior spatial awareness, indicative of the real-time, dynamic characteristics of digital sports simulations. No significant differences were observed between the two groups in cognitive flexibility, indicating that both types of gameplay enhance adaptability and cognitive abilities in comparable manners. The duration spent playing both games was positively related to enhancements in all three cognitive domains. These findings highlight the unique yet complementary cognitive advantages of both in-person and digital games, emphasising their potential for skill development beyond hobbies.

Keywords: Attention, Chess, Cognitive flexibility, football, Spatial awareness, Virtual games