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Effect of Coaches Pointing Gestures and Players Expertise on Visual Attention and Memorization of Tactical Scenes in Basketball

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Introduction

Learning tactics from a static diagram has been shown to increase learning among basketball players, as it is the preferred tool for coaches to convey tactical information (Khacharem et al., 2013). In addition to the verbal presentation, coaches make pointing gestures to direct players' attention to the key elements of play and to optimize teaching of tactical combination. The aim of this study was to examine the effect of coaches' pointing gestures on the memorization of tactical scenes and whether this effect can be modulated by player experience.

Method

Ninety-six participants (48 expert basketball players and 48 novices) took part in the experiment based on predetermined criteria. They were instructed to watch one of two experimental conditions, in which the coach either described the development of an offensive play system (no-gesture, No-G), or described the same play system while making pointing gestures (with-gesture, W-G). After visualisation, participants were instructed to rate their mental effort and reconstruct the game elements on a sheet of paper. Total fixation duration on the diagrams of play was measured using eye tracking.

Results

The results showed that novice players in the W-G condition achieved higher recall scores, lower investment of mental effort and more fixation time on the diagrams of play than novices in the N-G condition. However, expert players achieved the same recall scores, same investment of mental effort and the same fixation time on the diagrams of play in both experimental conditions.

Discussion

The findings revealed that for novice players, incorporating pointing gestures into speech when presenting game information is an effective technique to direct their attention to the game elements mentioned in the speech and improve their performance. Based on the cognitive load theory, learners' cognitive resources are limited and attention can only be paid to a part of the incoming information at a particular moment. Another explanation is that pointing gestures add a visual modality to the auditory modality (speech), which has a positive effect on learning, as explained by the modality effect. However, experts showed the same results under the two experimental conditions. These players do not need external guidance to learn the tactical knowledge because their prior knowledge provides complete guidance. The results can be explained by the expertise reversal effect, which suggests that an instructional design that is effective for novices can reverse and be ineffective for experts. The results suggest that the inclusion of pointing gestures in the learning material depends on players' level of expertise.

References

Khacharem, A., Zoudji, B., Kalyuga, S., & Ripoll, H. (2013). Developing tactical skills through the use of static and dynamic soccer visualizations: An expert–nonexpert differences investigation. *Journal of Applied Sport Psychology*, 25(3), 326-340.

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