Shortcomings of applying data science to improve professional football performance: Takeaways from a pilot intervention study

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1.Summary

This study explores using data science to enhance football performance, focusing on passing skills. Professional players received video feedback based on metrics like defensive disruption and outplayed opponents for two weeks. While there were no significant improvements in these specific metrics, the team showed increased performance in traditional indicators like passes and shots on goal. The study suggests that data-driven video feedback may indirectly benefit overall team performance, highlighting the need for further research to refine these interventions.

1.1Purpose/aims

1.   Explore using data science, specifically positional tracking, to enhance football passing performance.

2.   Connect data science research with practical football training by leveraging spatiotemporal data.
3.   Evaluate the effectiveness of video feedback, based on metrics like defensive disruption and outplayed opponents, in improving real-game passing.
4.   Assess the application of data science in practical training to enhance player performance in competitive settings.
5.   Conduct a pilot study with pro football players to understand the feasibility and potential benefits of integrating data science into football training.

1.2Contribution

1.   Innovative Application: Pioneers the use of data science, specifically positional tracking, to enhance football performance.
2.   Closing the Gap: Aims to bridge the divide between data science research and practical football training.
3.   Video Feedback Evaluation: Provides insights into the effectiveness of video feedback, using specific metrics, for improving on-field passing.
4.   Practical Feasibility: Explores how data science can practically benefit football training through a pilot study with professional players.
5.   Identifying Improvement Areas: Highlights factors like intervention duration and coach involvement crucial for successful integration of data science in football training.

1.3Methodology

The study involved 24 professional football players in pre/post-test matches, forming control and intervention teams. The intervention team received a 2-week video intervention on D-Def and NOO metrics without coaching. Data collection utilized a Spiideo camera for positional

tracking. Metrics included passes, penalty box entries, shots, pass length, and velocity. Analysis employed repeated measures ANOVA for pre/post-test and descriptive analysis. Ethics were ensured with approval and informed consent. Authors MH and TM conceived the study, with MH supported by DFB and Saarland University.

1.4Conclusion

The study comes to the conclusion that professional football players' positional tracking measures (D-Def and NOO) did not significantly improve after a two-week video intervention. Nonetheless, the intervention group saw numerical gains in conventional KPIs, indicating a favorable indirect impact. To close the gap between data science research and football practice, the study highlights the need for more comprehensive interventions, qualitative feedback, and collaboration between coaches and researchers.

2.Limitations

2.1Small Sample Size: Only 24 professional football players were included in the study, which may have limited how broadly the results may be applied. Expanding and diversifying the sample size may improve the conclusions' resilience.

2.2Brief Intervention Period: With only two weeks allotted to the intervention, participants may not have had enough time to completely understand and use the positional monitoring metrics. Extended periods of intervention may yield a more thorough comprehension of the efficacy of the methodology.

3.Synthesis

The study investigates how a two-week video intervention affects professional football players' positional tracking measures. The intervention team's standard performance measures indicated improvement, but the targeted metrics—D-Def and NOO—did not show any visible change. The results highlight the necessity of lengthier interventions and more cooperation between researchers and coaches in order to successfully use data science into football instruction.