Evaluación de la coherencia estratégico-táctica entre la preparación y el rendimiento de un equipo femenino de baloncesto

Assessment of strategic-tactical coherence between preparation and performance of a women's basketball team

Avaliação da coerência estratégico-tática entre a preparação e o desempenho de uma equipe feminina de basquetebol

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RESUMEN

La evaluación integradora de un equipo de baloncesto, que combina la fase de preparación y el rendimiento en el partido, es esencial para una correcta interpretación de los resultados por parte del entrenador. El objetivo de este estudio fue evaluar la coherencia entre la preparación del equipo y el rendimiento en el partido de un equipo de baloncesto femenino, con el apoyo de datos y considerando el énfasis y la eficiencia de los contenidos tácticos. La coherencia se evaluó con base en el énfasis dado a los contenidos de baloncesto predefinidos y su respectiva eficiencia, durante los entrenamientos y el partido. Los datos se recopilaron de un equipo universitario femenino, en preparación para el torneo nacional. La estrategia del equipo se evaluó a partir del manual de jugadas. Los datos de entrenamiento se recopilaron durante la pretemporada. El rendimiento competitivo se analizó en un partido. Se utilizaron métodos Bayesianos para calcular las distribuciones posteriores de los parámetros de tiempo de tareas de entrenamiento. El ataque posicional se enfatizó más que transiciones, tanto en entrenamientos como en el partido, con eficiencias similares en el encuentro. Las jugadas se priorizaron sobre las tácticas de grupo a lo largo de los entrenamientos (diferencia media posterior: 42.3 min/semana, DE: 10.1, IC 90% [25.8–58.9]) y en el partido, demostrando mayor eficiencia. El enfoque rastreó con éxito la coherencia preparación–rendimiento. Los entrenamientos reflejaron un proceso basado en el juego enfatizando la integración ataque-defensa y el ataque posicional. El enfoque puede proporcionar apoyo objetivo al entrenador.

Palabras clave: deportes de equipo, tácticas, métodos Bayesianos, análisis de rendimiento, eficiencia.

ABSTRACT

Integrative assessment of a basketball team combining the preparation phase and match performance is key for preventing coaches from misleading interpretations about outcomes. The goal of the study was to evaluate the coherence between team preparation and match performance in a women basketball team supported by data and considering the emphasis and efficiency on tactical contents. Coherence was evaluated based on the emphasis given to pre-defined basketball contents, and respective efficiency, during practices and match. Data were gathered from

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a women's college team (15 players; 20.0 ± 2.5 years old), in preparation for the national tournament. Team strategy was assessed from the season's playbook. Practice data was gathered from the full pre-season period. Competitive performance was analyzed from a match. Bayesian methods were used to compute the posterior distributions of the parameters for time of training tasks. Set offense was emphasized more than transition during both practice and match, although their match efficiencies were similar. Team plays were prioritized over group tactics throughout practices (posterior mean difference: 42.3 min/week, SD: 10.1, 90% CI [25.8–58.9]) and in match performance, demonstrating higher efficiency. Our approach successfully traced preparation–performance coherence in a basketball team. Practices reflected a game-based approach that emphasized offense–defense integration and set offense supported by team plays. Coherence was demonstrated by the higher proportion of set offenses relative to transitions, both during practices and match. Similarly, a greater proportion and efficiency of team plays compared with individual or group actions. The approach should provide objective coaching support.

Keywords: team sports, tactics, Bayesian methods, performance analysis, efficiency.

RESUMO

A avaliação integrativa de uma equipe de basquetebol, combinando a fase de preparação e o desempenho em jogo, é essencial para uma correta interpretação dos resultados pelos treinadores. O objetivo deste estudo foi avaliar a coerência entre a preparação da equipe e o desempenho em jogo de uma equipe de basquetebol feminino, apoiado por dados e considerando a ênfase e a eficiência dos conteúdos táticos. A coerência foi avaliada com base na ênfase dada aos conteúdos de basquete pré-definidos e sua respectiva eficiência, durante os treinos e o jogo. Os dados foram coletados de uma equipe universitária feminina, em preparação para o torneio nacional. A estratégia da equipe foi avaliada a partir do manual de jogadas da temporada. Os dados de treino foram coletados durante todo o período de pré-temporada. O desempenho competitivo foi analisado a partir de uma partida. Métodos Bayesianos foram usados para calcular as distribuições posteriores dos parâmetros de tempo das tarefas de treinamento. O ataque posicional foi mais enfatizado do que a transição, tanto nos treinos quanto no jogo, com eficiências semelhantes na partida. As jogadas foram priorizadas em relação às táticas de grupo ao longo dos treinos (diferença média posterior: 42.3 min/semana, DP: 10.1, IC 90\% [25.8–58.9]) e no jogo, demonstrando maior eficiência. A abordagem rastreou com sucesso a coerência preparação–desempenho. Os treinos refletiram um processo baseado no jogo que enfatizou a integração ataque-defesa e o ataque posicional. A abordagem pode fornecer suporte objetivo ao treinador.

Palavras chave: esportes coletivos, tática, métodos Bayesianos, análise de rendimento, eficiência.

INTRODUCTION

In team sports, the integration between preparation and performance is key for the coaching process. The need for precise feedback to interpret the team's achievements has led to several frameworks to support coaches (Fernandez-Echeverría et al., 2017; Groom et al., 2011; Lyle, 2002; Côté et al., 1995). Accordingly, coaches are expected to systematically use match analysis to improve team preparation (Gamonales et al., 2023). However, using analytical outputs to improve practice is a non-trivial task. It demands an accurate interpretation of the team's needs to emphasize the training contents coherently through meticulously designed technical-tactical tasks (Gamero et al., 2020; Ramos et al., 2020).

Still, a team's individual and collective learning is a non-linear process (Ramos et al., 2020), making it difficult to judge the success of the coach's decisions about the emphasis on practice (Gamonales et al., 2023; Mancha-Triguero et al., 2018). Besides evaluating the impact of all practice's implementations of conventional and innovative methods (Burkaitė et al., 2025). Such complexity embedded in the preparation-performance process frequently turns the match outcome into a reductionist reference of success for the whole team's preparation. An objective method for evaluating the team preparation and performance relationship should prevent misleading

conclusions (Suárez et al., 2023; Feu et al., 2023) and improve the assessment of a coach's coherence between the practiced contents and match requirements (Rangel et al., 2023; Groom et al., 2011; Mancha-Triguero et al., 2022b).

The benefits of integrative frameworks for improving performance (Gesbert et al., 2016) have been limited by the scarce practical implementations of their logical structures (Fernandez-Echeverría et al., 2017; Groom et al., 2011; Carling et al., 2005). Recently, some practical results have been generated through the team learning cycle (TLC), a framework that uses a common set of tactical-technical contents to describe the planning (i.e., the team strategy), the team practices (i.e., training sessions), and the match performance (Rangel et al., 2023). The tactical-technical contents assessed in the TLC were defined in previous contributions as exhaustive sets of offensive (Lamas et al., 2011; Santana et al., 2019) and defensive (Lamas et al., 2015) game actions, organized for describing basketball strategies (Lamas et al., 2014).

In this perspective, a team play may be interpreted as a concatenation of offensive game actions, from the set of space creation dynamics – SCDs (Lamas et al., 2011). The defensive counterpart may be interpreted by another set of space protection dynamics – SPDs (Lamas et al., 2015). These actions are performed in a match phase, e.g., offensive transition or set offense (Lamas et al., 2014). Both SCDs, SPDs, and match phases are persistent along the TLC and may be assessed for testing the coherence between the team preparation and the match performance. For instance, findings supported by the TLC evidenced inconsistencies for offensive plays when considering their training volumes, their frequencies of occurrence, and the respective efficiency in a match (Rangel et al., 2023). Often, efficient plays were not emphasized in practices or, controversially, in the match. Such inconsistencies between practice and match evidence the potential of an integrative assessment for improving the coaching process, minimizing some inherent interpretative biases (Franks and Miller, 1986) when conclusions are based on their own viewpoints and not on data (Wright et al., 2012).

Particularly for training practices, assessment should favor the understanding of the coach's choices about the teaching-learning methods applied and the match performance (Cañadas et al., 2018; Cañadas et al., 2015). Variables such as the match phases (e.g., offense, defense, mixed), training means (e.g., drill, game, etc.), or content type (e.g., strategic, tactical, technical) incorporate methodological insight about how the expected match demands were practiced (Ibáñez et al., 2016; Cañadas et al., 2012; Feu et al., 2023).

The main goal of the current study was to evaluate the coherence between the strategic-tactical contents of the preparation phase (i.e., planning the team strategy and team practices) and the match performance in a women's college basketball team. Coherence was analyzed by assessing the tendencies between the TLC's steps. In the match, we hypothesized that contents emphasized during practices would be more frequent and present a greater efficiency than others.

MATERIALS AND METHODS

Research design

This is a quantitative, observational, longitudinal study (Anguera and Hernández, 2013). We analyzed a women's basketball team's performance by integrating data from planning (team strategy), training (team practices), and match performance. For this purpose, we followed a previously defined framework for a basketball team preparation–performance assessment, the Team Learning Cycle (TLC) (Rangel et al., 2023). It embeds the concept of players' ongoing learning about the match as a consequence of the interactions among them and the environment over the sportive season, in a cyclic process updated after every match of the season (Rangel et al., 2023).

TLC performance was primarily analyzed through the associations between the emphasis placed on plays, their corresponding SCDs, and related content during both training sessions and the match, as well as their match

efficiency. The strategy playbook was interpreted according to previously established guidelines (Lamas et al., 2014) and recorded in a Microsoft Excel (version 2021) spreadsheet. Data from the training sessions were obtained by assessing the coach's diary and also recorded in a spreadsheet for later analysis. The match was recorded using a Samsung HMX-F90 portable video camera, and subsequently reviewed on a personal computer, with relevant data extracted into an Excel spreadsheet.

Participants

A college women's basketball team participated in this study during the 8-week pre-season period for the Central Conference of the Brazilian National College Basketball Tournament. The sample consisted of 15 players (20.0 ± 2.5 years old) with at least three years of regional level competitive experience. Team players participated consistently throughout the entire pre-season training period and in the official match, with no reported injuries and no consecutive absences.. Practices occurred four times per week during the complete period. On-court practices lasted one hour and a half, on average, being supplemented by strength and conditioning training sessions that varied between two and three times per week. The head coach held a degree in Sport Sciences and had five years of coaching experience.*Instrumentos*

Procedures

First, the team's head coach provided the required resources to support the empirical analysis of the TLC steps. We assessed the team strategy from the season's playbook with sequential diagrams of each team play, including the players involved and the location on the court where the play took place. We broke down the team strategy based on the plays and their respective SCDs (i.e. 1x1, cut, handoff, pick, post-up, screen, spot-up), following previously defined criteria (Lamas, et al., 2014).

Second, we gathered practice data from the pre-season period of the team preparation. Data was obtained from the coach's daily training plans and recordings were used for conference. A total of twenty-five training sessions were performed during 12 weeks (50 hours of practice). We aggregated time allocated to different match phases emphasized in the practices, the team plays, their respective space creation dynamics - SCDs (Lamas, et al., 2011) and their defensive counterparts, the space protection dynamics - SPDs (Santana, et al., 2015). We also assessed the following subset of practice variables (Ibañez, et al., 2016): i) match phases - offense, defense, mixed; ii) content types - strategic (video-based or on-court contents, focused on the understanding of the team strategy), tactical (individual, group, collective, with opposition and performed within match context), technical (individual, focused on technical skills improvement); iii) training means - drill (analytic task, without opposition, with emphasis on game related technical skills, e.g. shooting), "walk-through" (on-court, collective, without opposition, focused on adjustments related to timing, angles, etc), game (situational tasks, with emphasis on individual or group tactics), competition (situational tasks, with emphasis on collective tactics).

Third, we analyzed competitive performance from a match immediately after the end of the training period considered in the study. This was the first match of the conference phase of the national college basketball tournament. We looked at the team offense and noted: i) the offensive sub-phases (i.e. set offense, transition offense); ii) set plays, SCD-based offenses, and the respective outcome (two points shot, three points shot, shooting foul, defensive foul, offensive foul, turnover). We measured efficiency in terms of shots per possession. Table 1 summarizes the class, name, measurement, and purpose of analysis for all variables in the study.

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Table 1

Variables, Measurement Methods, and Analytical Purpose within the Team Learning Cycle (TLC).

Variable Class	Variable Name	Measurement	Purpose in the Analysis
Team Strategy (TLC Step 1)	Team Strategy (Plays and SCDs)	Analysis of the season's playbook using sequential diagrams.	To characterize the structure of the team's offensive strategy and its emphasis on SCDs.
Training (TLC Step 2)	Time dedicated to Match Phases (Offense, Defense, Mixed)	Aggregation of time allocated in the daily training plans (25 sessions).	To analyze the weekly distribution of training time and its association with strategy and match performance.
Training (TLC Step 2)	Time dedicated to Content Types (Strategic, Tactical, Technical)	Aggregation of time allocated in the daily training plans (25 sessions).	To evaluate the focus on content types
Training (TLC Step 2)	Time dedicated to Training Means (Drill, Walk-through, Game, Competition)	Aggregation of time allocated in the daily training plans (25 sessions).	To evaluate the focus on training means
Training (TLC Step 2)	Proportion of Plays/SCDs/SPDs emphasized	Categorization from daily training plans.	To describe the frequency with which strategic elements are emphasized in practices.
Match Performance (TLC Step 3)	Offensive Sub-phases (Set Offense, Transition Offense)	Analysis of the match immediately following the training period.	To describe the context of offensive plays in the match.
Match Performance (TLC Step 3)	Plays and SCDs executed	Analysis of the match immediately following the training period.	To describe the proportion of strategic elements executed during the match.
Match Performance (TLC Step 3)	Possession Outcome	Analysis of the match immediately following the training period.	To evaluate the efficiency of plays/SCDs execution.
Match Performance (TLC Step 3)	Offensive Efficiency	Measured as Shots per Possession.	To quantify the efficiency of the team offense in the match.

A single evaluator was responsible for collecting all data related to the TLC. Prior to the beginning of the study, both intra- and inter-observer reliability were assessed for all TLC phases. The assessment involved two observers (sports scientists, regional level basketball coaches) that collected data on two different occasions with a two-week interval between them, following established procedures (James et al., 2007; O'Donoghue, 2007).

In the analysis of team strategy, the evaluator examined a set of five plays taken from the analyzed team's playbook, re-evaluating the same set after the established interval. For the training stage, ten sessions were analyzed, and after the same interval, the procedure was reapplied. In the match stage, 50 ball possessions from a professional women's basketball game were analyzed, in which the evaluator categorized the game phases, team plays, SCDs, and corresponding outcomes, recording the same variables observed in the previous stages. These three stages followed a procedure similar to that described by Monteiro et al. (2024).

Reliability rates were calculated according to the levels of agreement for Cohen's Kappa coefficient, following the criteria proposed by Landis and Koch (1977): less than chance agreement (< 0), slight (0.01–0.20), fair (0.21–0.40), moderate (0.41–0.60), substantial (0.61–0.80), and almost perfect agreement (0.81–0.99). Results showed Kappa values ranging from 0.91 to 1.00 for variables related to training practices and the match (offensive sub-phases, plays, and SCDs).

Methods applied in this study were approved by the Institutional Review Board of Brigham Young University and complied with the ethical principles established in the Declaration of Helsinki and the Ethical Standards in Sport and Exercise Science Research (Harriss et al., 2019). According to the Belmont Report (National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1979), the analysis was based on publicly available audiovisual material; therefore, obtaining informed consent from the athletes was not required, as none of the collected variables on team tactics contained personal or identifiable information. The basketball team's coach provided written informed consent acknowledging his voluntary participation and authorizing the use of the team's strategic playbook and the description of the training sessions for research purposes. Data were processed in accordance with Organic Law 3/2018 on the Protection of Personal Data and Guarantee of Digital Rights of Spain.

Statistical Analysis

We used descriptive and inferential analysis to evaluate the TLC steps and the associations between them. We applied descriptive statistics to characterize the structure of the team's offensive strategy in terms of the number of plays, its respective SCDs, and the location on the court the SCDs were planned to be executed.

A Bayesian approach was used to compute the posterior distributions of the parameters of interest, specifically the weekly mean time dedicated to each training variable (game phases, training means, and content types). The Bayesian approach to analysis enables the use of posterior distributions to perform both estimation and probabilistic assessment of hypotheses relating distinct events to possible outcomes, currently in a basketball TLC. Practical advantages of the Bayesian paradigm have been advocated for some time, and include the enrichment of statistical models with prior knowledge, allowing the models to make meaningful predictions about data. This analytic perspective enables modeling the parameter uncertainty with prior and posterior distributions. Monte Carlo simulation from posterior distributions further enables assessment of functions of estimated quantities, together with uncertainty. A brief tutorial (Etz et al., 2018) or more comprehensive introductions to the topic (McElreath, 2020; Kruschke, 2014) are available.

Because the training time variables showed right-skewed distributions, the observed data were modeled using a Gamma distribution as the likelihood function. For the analyses comparing time spent by week, an implicit hierarchical model was used where each week had its own mean parameter. For variables summarized across the entire period, a simpler model with a single mean parameter was adopted. In all cases, fairly non-informative priors were used for the parameters of the likelihood distributions, ensuring the posterior distributions were driven primarily by the data. The posterior distributions were approximated using Markov Chain Monte Carlo (MCMC) draws for the parameters. Three independent chains were run for most analyses. Each chain ran for 25,000 iterations. The first 5,000 iterations were discarded as burn-in. Convergence was verified through visual inspection of trace plots and by computing the R-hat statistic (Gelman–Rubin), the Effective Sample Size (ESS), and the Raftery–Lewis and autocorrelation diagnostics. Inference was based on the summary statistics of the full posterior distribution, using the posterior mean as the primary point estimate. The term "significantly different" was used when the posterior probability (p.prob) of the difference exceeding 0 was > 0.90. We used the computer program JAGS (Plummer, 2012) to simulate chains approximating the posterior distributions of interest. The proportion of offensive sub-phases, plays and SCDs both in the team practices and in the match were described. Play efficiency was rated by shots per possession. All analyses were conducted using R statistical software with packages rjags, and psych (Team R, 2000).

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RESULTS

The offensive team strategy included nine plays and their respective SCDs. The most recurrent SCD in the team strategy was the screen (51.4%) followed by the cut (25.7%). The screen was also the SCD that most frequently terminated the plays (14.2%). Figure 1 illustrates the allocation of the SCDs in the team strategy. The court diagrams (left side) display the SCDs in Play 1. Each column of the dendrogram represents a play. In a play, colors correspond to SCDs.

Figure 1

Offensive team strategy of the women's college basketball team. Plays structure in terms of SCDs, differentiated by colors, and their respective court locations, as informed inside the circles - with the following abbreviations - top key: TK; right-wing: RW; left-wing: LW; right-corner: RC; left-corner: LC; right-high-post: RHP; left-high-post: LHP; right-low-post: RLP; left-low-post: LLP.
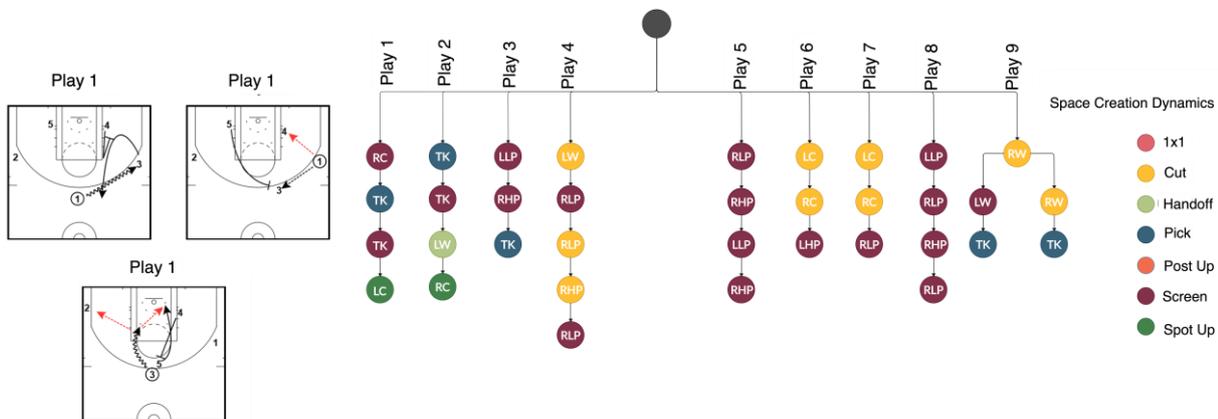
Each practice consisted of, on average, 11.6 discrete sections and ran for an average time of 110 minutes. Figure 2 displays the mean estimates for training time per week for the variables match phases (offense, defense, mixed), training means (drill, walk-through, game, competition) and content types (strategy, tactics, technics). For the match phases, offense (posterior mean: 40.6 min/week, posterior SD: 2.5, 90% credible interval [36.8–44.9]) and mixed practice (combining offense and defense; posterior mean: 38.2 min/week, posterior SD: 2.7, 90% CI [33.9–42.8]) were significantly more frequent than defense (27.8 min/week, SD: 2.44, 90% CI [23.9–32.0]). The posterior differences between offense and defense, and between mixed and defense, were respectively: offense – defense (12.9 min/week, SD:3.5, 90% CI [7.3–18.7]) and mixed – defense (10.5 min/week, SD: 3.7, 90% CI [4.5–16.5]).

Regarding training means, games (56.0 min/week, SD: 2.5, 90% CI [52.0–60.2]) were significantly more emphasized than all other activities: drills (9.7 min/week, SD: 2.2, 90% CI [6.7–13.7]), walk-through (18.5 min/week, SD: 0.9, 90% CI [16.9–20.0]), and competition (22.6 min/week, SD: 1.6, 90% CI [20.0–25.4]). The posterior differences between games and the other training means were, respectively: game – walk-through (37.5 min/week; SD: 2.6, 90% CI [33.2 – 41.9]); game – drills (46.3; SD: 3.3; 90% CI [40.7 – 51.6]); game – competition (33.4; SD: 3.0; 90% CI [28.5 – 38.4]). For the content types, tactics (posterior mean: 78.6 min/week, SD: 3.4, 90% CI [73.1 – 84.3]) were significantly more emphasized than strategy (posterior mean: 20.1 min/week, SD: 1.1, 90% CI [18.5 – 21.9]), and technique (posterior mean: 7.9 min/week, SD: 1.3, 90% CI [6.1 – 10.4]). The posterior differences between tactics and strategy, techniques were, respectively: tactics – strategy (mean difference: 58.45 min/week; SD: 3.5, 90% CI [52.8 – 64.4]); tactics – technique (mean difference: 70.6; SD: 3.6; 90% CI [64.6 – 76.8]).

Figure 2

Posterior means for practice time: match phases, training means, and content types during the 12-week preparation period.
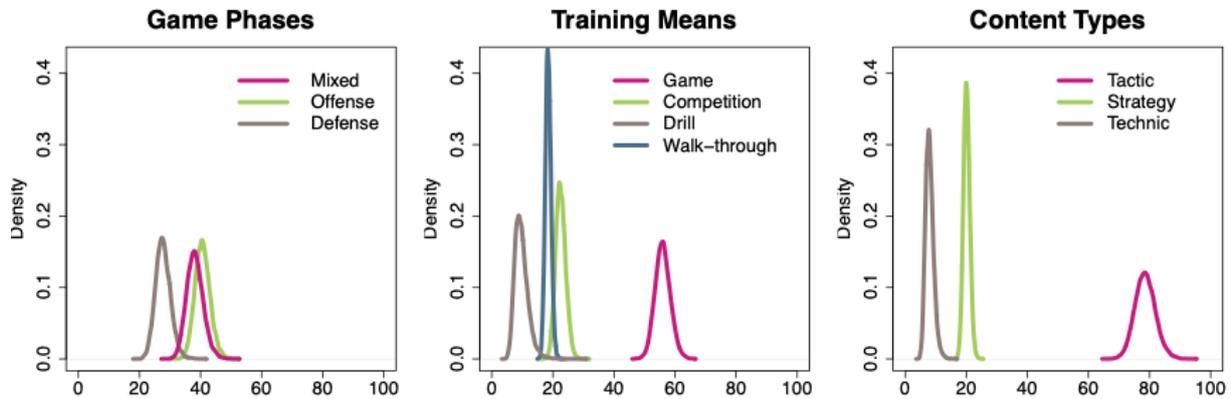

Figure 3 illustrates that the time spent practicing set offense (posterior mean: 70.1 minutes, SD: 11.3, 90% CI [53.7 – 90.1]) and "all" - i.e. concatenation of transition and set offense – (posterior mean: 61.4 minutes, SD: 5.8%, 90% CI [52.5 – 71.4]) were significantly greater than transition alone (posterior mean: 31.6 minutes, SD: 13.1, 90% CI [16.7 – 55.3]). The posterior differences were: set offense – all (posterior mean: 8.7 min/week; SD: 12.7, 90% CI [-10.6 – 30.9]); set offense – transition (posterior mean: 38.5 min/week; SD: 17.2, 90% CI [9.9 – 64.1]). Additionally, there was significantly more emphasis on plays (posterior mean: 82.9 minutes, SD: 7.8, 90% CI [70.7 – 96.2]) than on SCDs (posterior mean: 40.5 minutes, SD: 6.5, 90% CI [31.1 – 52.1]) and SPDs (posterior mean: 35.2 minutes, SD: 3.9, 90% CI [29.3 – 42.0]) during the 12-week preparation period. The posterior differences were: Plays – SCDs (posterior mean: 42.3 min/week; SD: 10.1, 90% CI [25.8 – 58.9]); plays – SPDs (posterior mean: 47.6 min/week; SD: 8.7, 90% CI [33.7 – 62.1]).

Figure 3

Posterior means for practice time during the 12-week preparation period. Part A presents the posterior means for practice time across match phases: Set offense, Transition, and All (concatenation of Transition and Set offense). Part B shows the posterior means for Plays, SCDs, and SPDs.
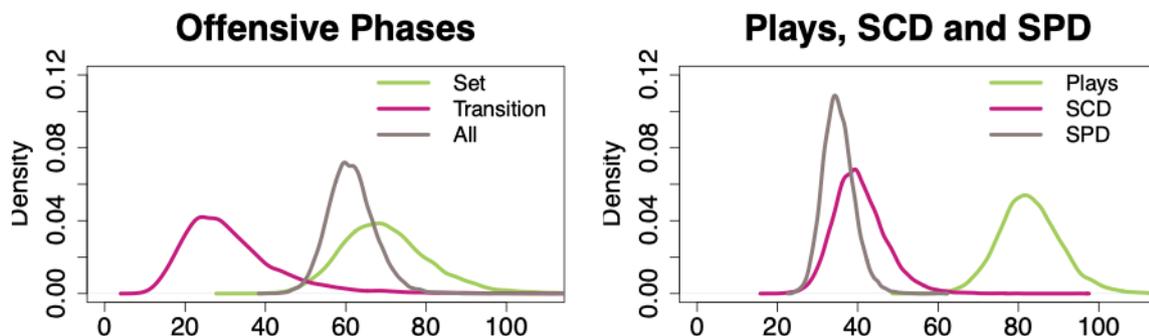

Figure 4 shows the variability of time spent on offensive sub-phases – set offense and transition – over the 12-week preparation period and the match. There is a similarity of emphasis on sub-phases until week seven. From week eight on, emphasis on set offense is pronounced until week twelve. Week twelve has the greatest difference

between sub-phases for the whole practice period (set offense: 78.0%, transition: 22.0%). It corroborates the match tendency, which presented an even greater difference for the percentage of ball possessions (set offense: 85.0%, transition: 15.0%). Although less frequent in the match, transition presented a similar rate of shots per possession (.61) to set offense (.57).

Figure 4

Proportion of time used for the offensive sub-phases (set offense and transition) in the 12-week preparation period and the proportion of ball possessions during the match (week 13). Numeric values over the match proportions indicate the shots per possession during match at week 13.
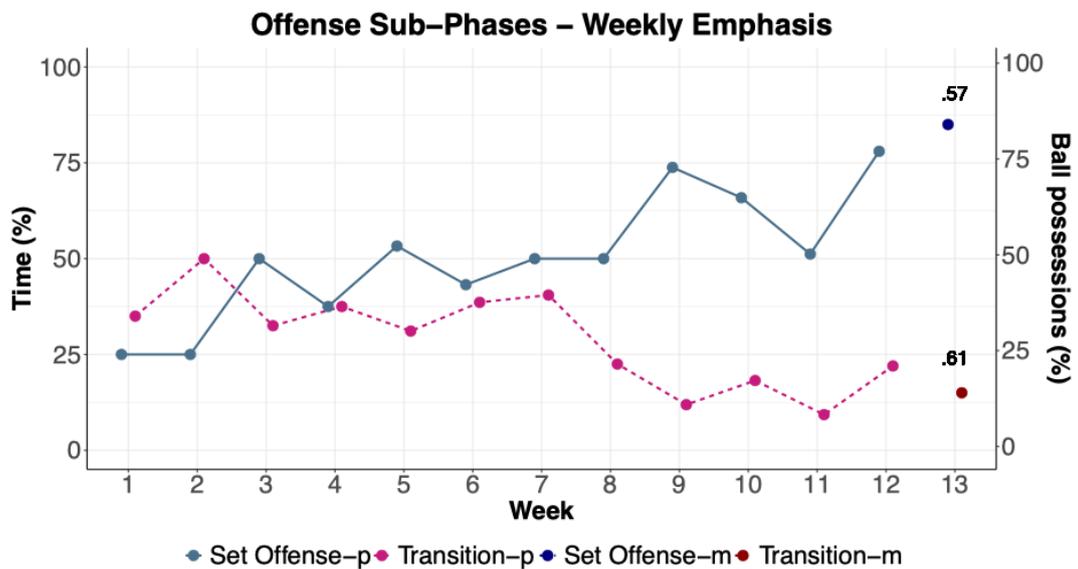

Figure 5 displays the variability of Plays, SCDs, and SPDs over the 12-week preparation period and the match. The emphasis on team plays declined after the ninth week indicating an overall decrease in the training volume. SCDs and SPDs exhibited similar emphasis, in minutes of practice, throughout almost the whole preparation phase. The relative proportions between plays and SCDs were fairly consistent in the training period (percentage of minutes per week) and in the match (percentage of ball possessions). During practices, there was a greater emphasis on plays than on SCD-based offenses. In the match, plays were performed in greater proportion (55.0% of ball possessions) in comparison to SCDs (36.3%) as well. Still, team plays (.84) led to a greater efficiency in shots created than SCDs (.67).

Figure 5

Proportion of time used for Plays, SCDs, and SPDs across the 12-week preparation period and the proportion of ball possessions during the match (week 13). Numeric values over the match proportions indicate shots per possession, where XXp refers to practice data and XXm refers to match data.
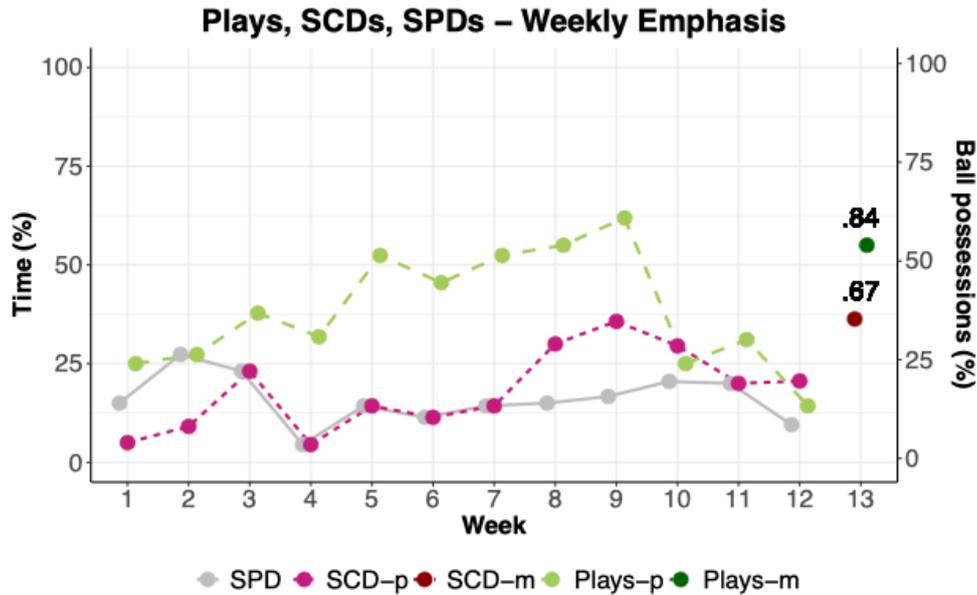
DISCUSSION

This study presented empirical evidence of the coherence between the strategic-tactical preparation and match performance of a women's college basketball team. Evidence was supported by the Team Learning Cycle (TLC) framework, which integrates data from a team's planning (i.e., team strategy), practice (i.e., training sessions), and match performance, taking a formal description of basketball contents as reference (Lamas et al., 2014).

The team strategy included a concise set of plays. Training sessions significantly emphasized team tactics, the offensive phase, and practices through small-sided games, an approach consistent with pedagogical models that promote game-based learning (Gamero et al., 2020). Training practices and match consistently presented greater recurrences of set offense and team plays than, respectively, transition game and SCD-based offenses. Still, preparation-performance coherence was evidenced by the greater rates of offensive efficiency in the match within the offensive alternative mostly emphasized, the team plays, in comparison to SCD-based offenses.

Tracing causality in a team's preparation-performance process has been a long-term challenge (Bourdon et al., 2017; Fernandez-Echeverría et al., 2017; Groom et al., 2011; Carling et al., 2005), motivating further development of decision-support systems (Schelling & Robertson, 2020), including those focused on strategic-tactical variables (Rangel et al., 2023). Monitoring team strategy and its related tactical contents requires a consistent set of variables that can serve as performance indicators for both practice and match analysis (Scanlan et al., 2025; Gamonales et al., 2023).

Supported by the TLC, we took the team strategy as a reference and broke it down into match phases, team plays, SCDs, and SPDs. We used these variables to analyze the emphasis applied to them at each preparation-performance step. Since training variables frequently did not present normal distributions, Bayesian inferential methods were applied for their flexibility in handling non-parametric data (Gelman et al., 1995). The pertinence of Bayesian methods for analyzing sports data has been further emphasized in the literature (Baumer et al., 2023; Santos-Fernández et al., 2019; Percy, 2015).

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Analysis of the team strategy revealed a straightforward match plan for the women's team assessed. A small set of plays, with few variations, defined the team strategy. Within these plays, the most recurrent SCD was the screen, followed by the cut. Screens were the most common SCD used to conclude the plays as well. The emphasis on screens suggests the intention to create space through sequential timing and positional advantages until a scoring opportunity arises. Interestingly, the typical higher frequency of "picks", i.e., on-ball screens, commonly found in men's basketball (Nunes et al., 2016) was not observed in this women's team, supporting the notion that female teams tend to favor motion-based and off-ball movement strategies (Cotta-Ortega et al., 2025).

Post-up plays, another main game action in men's games (Nunes et al., 2016), were not emphasized either. The lower reliance on on-ball screens and the higher occurrence of cuts reinforces the idea that this team's match plan prioritized a collective, progressive space-creation offense. This aligns with evidence in women's basketball showing that higher shot-conversion rates are associated with a greater frequency of passes and ball reversals (Cotta-Ortega et al., 2025).

According to the training variables assessed (i.e., match phases, training means, and content types), the practice structure should be characterized as emphasizing offense and offense-defense phases over defense (p.prob > 0.90). There was also a prioritization of small-sided games over analytical drills, walk-throughs, and scrimmages (p.prob > 0.90), confirming the trend toward using game-based pedagogical methods in basketball (Cañadas and Ibáñez, 2010). Tactics were more emphasized than technical or strategic contents (p.prob > 0.90), indicating the alignment with a current, general, trend of prioritizing decision-making–oriented training stimuli (Shalom et al., 2025; Jarraya et al., 2023). At the same time, it highlights the emphasis given to the development of players' understanding of game principles through ecological approaches.

For the training means, competition (i.e., scrimmages) was significantly less frequent than game (i.e., small-sided games), which aligns with evidence supporting the pedagogical and physiological benefits of task design to enhance transfer to match situations (Mancha-Triguero et al., 2022a; Clemente et al., 2021; Ibáñez et al., 2015).

Complementarily, the analysis showed a significantly greater focus on the set offense and the concatenation of offensive transition and set offense compared to transition alone (p.prob > 0.90). This suggests the coach did not aim for a high offensive pace but rather prepared the team for efficient half-court play, a feature consistent with findings on pre-competition load organization in professional basketball (Calle et al., 2025). Team plays were also significantly more frequent in practices than SCDs (p.prob > 0.90), corroborating the idea of preparation for a stable, collective half-court performance. The structure of practice and the coach's choices regarding content offer valuable insights into the construction of tactical performance later assessed in the match. The emphasis on half-court team plays appears to have been supported by progressive practice scenarios that alternated between smaller situational games and full-play executions, aligning with evidence from training task design in formative basketball (Mancha-Triguero et al., 2018).

Coherence between training and match performance was found for both variables used to trace the team strategy implementation, the offensive subphases and the strategic structures (team plays/SCDs). For offensive subphases, the greater frequency of set offense in comparison to transition found in practice—a pattern that particularly intensified after the first half of the preparation period—was affirmed in the match. The efficiency was observed to be similar for both set offense and transition, suggesting that the training focus successfully prepared the team for reliable execution in both subphases.

Additionally, the emphasis given to practicing team plays more often than SCD-based offenses established a pattern that was reflected in the match. This greater focus throughout most of the preparation period corresponded to higher efficiency in the match for team plays, reinforcing the coherence between preparation emphasis and performance efficacy.

The study presents some limitations. First, only a single match was analyzed, which restricts the interpretation of trends to that specific match and prevents comparisons with patterns observed during an entire season. Second, the team examined was at the college level, limiting the generalizability of the findings to professional contexts. Third, since a single team was analyzed, the analysis of the effect of the coach's self-defined profile and resulting training methodology on the design of training tasks and load progression (Mancha-Triguero et al., 2018) could not be evaluated.

Specifically in terms of women's basketball, the study highlights the importance of adapting offensive strategies to the specific characteristics of women, rather than replicating male-oriented tactical frameworks. Progressively, the efforts in regards to scientific knowledge about women's basketball are increasing. These advances span research on physical preparation (Flórez-Gil et al., 2025, Scanlan et al., 2025), playing positions (Péndola-Reinecke et al., 2025), and specific steps within the TLC (Cotta-Ortega et al., 2025). Future research may further clarify how opponents' tactical behavior influences preparation–performance coherence, thereby expanding our understanding of the reciprocal top-down and bottom-up dynamics involved in team strategy development (Ribeiro et al., 2019).

CONCLUSIONS

This study reinforces the Team Learning Cycle (Rangel et al., 2023) as a valid and practical framework for monitoring, integrating, and evaluating strategic, tactical coherence in the preparation–competition continuum of a women's basketball team. The results demonstrated that the training structure—characterized by an emphasis on tactical content, offensive phases, and collective plays practiced through small-sided games—was reflected in the team's competitive behavior. From an applied standpoint, coaches are encouraged to systematically monitor the relationship between training design and competitive outcomes, ensuring that the tactical priorities defined in practice are effectively transferred to the match context. The TLC offers appropriate support to coaches ensure the effective transfer from training to competition.

The TLC can be adapted and applied to different team sports, helping address the challenge of objectively linking preparation to competition. Overall, the coherence assessment through the TLC framework represents a valuable benchmark for improving collective efficiency and applied coaching science in women's basketball.

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