Assessment of Training Competencies and Coaching Styles of Badminton Coaches

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Abstract- This study evaluated the training competencies and coaching methodologies of badminton coaches at selected universities in Hunan Province, China, as perceived by student-athletes. The research employed a comparative-correlational design to investigate variations in coaching competencies and styles across demographic profiles, including sex, age, and years of playing experience. It examined the correlation between coaching styles and competencies. We obtained data from 59 student-athletes at six different colleges and used descriptive statistics, the Mann-Whitney U test, the Kruskal-Wallis H test, and Kendall's Tau correlation to analyze it. The findings indicated that sex did not have a significant impact on coaching competencies. Age and years of playing experience, on the other hand, were important. Younger coaches were better at motivating players and helping them develop as individuals, whereas older coaches were better at technical skills. There was a strong link between coaching styles and competencies. Command and reciprocal styles had an impact across broader areas, whereas problem-solving and guided discovery styles were better suited to technical growth. A statistically significant but low correlation confirmed that the choice of coaching style has a positive effect on competency outcomes. Based on these results, an Enhanced Coaching Training Program (ECTP) was proposed to align competencies across demographic groups, enhance style versatility, and encourage ongoing professional development. This would support the overall growth of athletes and the alignment of institutions.

Keywords: Training Competencies, Coaching Styles, Badminton Coaches, Athlete Development, Enhanced Coaching Training Program (ECTP)

INTRODUCTION

One of the most important aspects of an athlete's development is coaching; therefore, for a coach to be successful, they must be able to integrate all components of an athlete's development through technical and tactical training, motivation, and character development during training and competition. Effective coaching in college athletics enables athletes to develop skills and adaptive strategies for competition and to prepare psychologically for competition. In the sport of badminton, where an athlete must execute technical skills while preparing to anticipate and tactically respond to the opponent's behaviour, mental toughness becomes another critical factor in the athlete's success. Additionally, evidence indicates that athletes who participate in organized sports experience improved mental health and well-being, further strengthening the need to examine coach behaviours in the context of athlete development in post-secondary/college-level coaching programs and their effects on the sport of badminton in China (e.g., Hunan). As noted above, while a large body of literature exists on professional and national-level badminton coaching, there remain two significant gaps in collegiate-level programs in China, specifically in Hunan Province. First, most research focuses on the elite athlete population, centralized systems, and performance analytics. At the same time, very few studies have explored the relationship between coaching style (command, reciprocal, problem-solving, and guided discovery) and training competencies (practice and competition/game strategy/motivation, character building, skill development/technique) as it applies to collegiate athletes where maturity, institutional priorities, and availability of resources vary from those of elite professional athletes. Second, many of the studies emphasize the identification of a coach's own perceptions and/or the use of objective performance measurements; however, the perspective of the athlete in terms of their experience with coaching, motivational factors, and how coaches interact with their players is crucial to understanding the effectiveness of coaching practices in relation to their ability to impact an athlete's growth in performance and learning positively. Through an athlete-centered lens, the effectiveness of coaching in higher education sport can be evaluated beyond the technical development of athletes to encompass the quality of communication, the adaptability of support, and the emotional care provided by coaches. To provide a framework for the relationships represented in this lens, the current study draws on Social Cognitive Theory (SCT). To view these relationships, SCT posits reciprocal influence among individual personal factors, behavioral patterns, and the environment; learning occurs through observation of others' behavior via modeling and/or trial-and-error, combined with feedback on the outcomes of these behaviors. Coaches, with respect to SCT, utilize coaching styles as behavioral models that the athlete (i.e., the student-athlete) observes and internalizes. At the same time, training competencies are the capacities developed and used by the coach to instruct the athlete in organizing practice, developing the athlete's strategy, and providing emotional support. Directive approaches (e.g., command) can enhance clarity, discipline, and consistency; collaborative methods (e.g., reciprocal) can strengthen communication, accountability, and trust; and autonomy-supportive styles (e.g., problem-solving and guided discovery) can cultivate critical thinking, decision-making, and self-regulation. Accordingly, we expect distinct styles to align differentially with competency domains, for instance, problem solving and guided discovery with technical growth, and command and reciprocal styles with broader practice management, motivation, and character building.

This study, therefore, assesses the training competencies and coaching styles of badminton coaches at selected universities in Hunan Province, China, as perceived by student-athletes. Specifically, it (1) describes the levels of four coaching styles command, reciprocal, problem solving, guided discovery and six competency domains, practice & competition, game strategy, motivation, character building, skill development, technique; (2) examines differences in styles and competencies across athlete profiles (sex, age, and years of playing experience); and (3) tests the association between coaching styles and training competencies. Through focusing on athlete perspectives and examining demographic variables that moderate the influence of style-competency pairing, this research intends to create evidence-based recommendations for the Enhanced Coaching Training Program (ECTP) to support increased versatility of coaching style, improved strategic competency development, and holistic development of coaches within university badminton. There are two main contributions of this research to the existing body of knowledge. Conceptually, the findings of this research will provide clarification regarding how pairing styles with competencies operates in practice by providing coaches with a way to connect their pedagogical approach to what they are trying to achieve (e.g., using guided discovery in a manner that promotes tactical creativity while leveraging reciprocal teaching to foster motivation and team cohesion). Practically, the research will develop a structured ECTP that utilizes empirical data regarding the style-competency pairings, enabling universities to establish an ongoing professional development program to revise their curricula and establish policies. In doing so, the research responds to ongoing calls in sport coaching and physical

education for athlete-centered evidence and pedagogical adaptability, while reinforcing the broader educational value of sport for mental health and holistic growth (Arsović et al., 2019).

METHODOLOGY

This study employed a cross-sectional, analytic-observational design with comparative and correlational components. The design examined (a) differences in coaching styles, command, reciprocal, problem-solving, and guided discovery, and training competencies, practice & competition, game strategy, motivation, character building, skill development, and technique, across athlete profile groups (sex, age, and years of playing experience), and (b) associations between coaching styles and competencies as perceived by student-athletes in university badminton programs.

1. Participants

Student athletes (N = 59) enrolled in badminton programs at six universities in Hunan Province, China, participated. Inclusion criteria were: (1) current membership in a university badminton team, (2) ≥1 year of formal playing experience, and (3) exposure to regular training led by a designated coach. Participation was voluntary and anonymous; no personal identifiers were recorded. The sample size and inclusion criteria reflect routine practice in sport education research and support non-parametric inference for Likert-type outcomes.

2. Instruments

Two structured questionnaires captured athlete perceptions of coaches:

- Coaching Styles Scale (command, reciprocal, problem solving, guided discovery): items rated on a 4-point frequency scale (1 = never to 4 = always).
- Coaching Training Competency Scale (practice & competition, game strategy, motivation, character building, skill development, technique): items rated on a 4-point competence scale (1 = low to 4 = high).

Prior to data collection, both tools were validated by experts and subjected to back-translation to ensure accurate language use. Internal validity (coefficient of reliability) was assessed using multiple methods, including Cronbach's alpha, and subscale reliability met established standards in the sport coaching research literature.

3. Procedure

Institutional policies and regulations permitted researchers to collect data through scheduled meetings with each participant, who was provided with a copy of the research project's objectives and allowed to provide voluntary, informed consent to participate in the study. Questionnaires were administered in small groups, with the researcher present to provide uniform instructions and prevent inadvertent omissions of data. The questionnaires were sealed for transport to the site where data analysis would occur, thereby maintaining each participant's confidentiality, consistent with accepted codes of conduct for sports science research.

5. Statistical Analysis

The analysis of the Likert-type outcome data was pre-registered to treat all outcomes as ordinal. Various descriptive statistics (i.e., frequencies, percentages, medians, and interquartile ranges) were used and examined for each Likert-type outcome. Differences between groups were evaluated using the Mann-Whitney U test (binary grouping, e.g., sex) or the Kruskal-Wallis H test (multiple categories grouping, e.g., age band and years of experience), along with Dunn's post hoc tests and Holm-Bonferroni corrections for multiple comparisons. The association between coaching style and competency domains was examined using Kendall's tau-b (τb) with a 95% confidence interval. Effect sizes (e.g., Cliff's δ for two-group comparisons) were reported for all inferential statistics. The α level used to discern statistical significance was set at 0.05 (two-tailed). Results are presented across the text, tables, and figures, in accordance with the recommended practice.

RESULTS & DISCUSSION

The Profile of the Respondents

A total of 59 student-athletes completed the survey. The sample comprised 37 males (62.7%) and 22 females (37.3%). All respondents were aged 18–30 years: 18–20 years, 28 (47.5%); 21–30 years, 31 (52.5%); no participants were ≥31 years. Regarding years of playing experience, the distribution was 1–3 years, 2 (3.3%); 4–6 years, 9 (15.3%); 7–9 years, 9 (15.3%); and ≥10 years, 39 (66.1%).

Table 1. The Demographic Profile of the Respondents

	Category	Frequency	Percentage
Sex	Male	37	62.7
	Female	22	37.3
	Total	**59**	**100.0**
Age	18-20 years old	28	47.5
	21-30 years old	31	52.5
	31-40 years old	0	0.0
	41-50 years old	0	0.0
	51-60 years old	0	0.0
	Total	**59**	**100.0**
Years of Playing Experience	1-3 years of experience	2	3.3
	4-6 years of experience	9	15.3
	7-9 years of experience	9	15.3
	10 years or more experience	39	66.1
	Total	**59**	**100.0**

Badminton Coaching Styles

Across the four styles shown in Table 2, athletes reported consistently high use (overall mean = 3.44, SD = 0.65; 1–4 scale), interpreted as "Always." The problem-solving approach recorded the highest mean (3.52, SD = 0.72; Rank 1), followed by guided discovery (3.49, SD = 0.76; Rank 2) and the reciprocal approach (3.47, SD = 0.68; Rank 3); the command approach, though still within "Always" was lowest (3.29, SD = 0.63; Rank 4). Taken together, the pattern indicates a hybrid coaching profile emphasizing cognitively engaging and autonomy supportive methods (problem solving, guided discovery) alongside collaborative communication (reciprocal), with directive behaviors (command) used less frequently yet present for clarity and discipline an emphasis consistent with reports on supportive/charismatic leadership, resilience, and technical learning in badminton and collegiate sport (Alia, Ullah, Pervez, Nayab, & Ahmed, 2024; Huang, 2023; Tan, Shen, & Zhou, 2025; Hartanto et al., 2025) and aligned with competency based and evolving coaching frameworks in sport science (Risjanna, Novan, Syihab, & Rimasa, 2025; Fernandez, 2022; Du, 2025; Edmizal, Rahman, Barlian, Donie, & Alnedral, 2024).

Table 2. The level of Coaching Styles

Coaching Style	Overall Mean	Standard Deviation	Verbal Interpretation
Command Approach	3.29	.63	Always
Reciprocal Approach	3.47	.68	Always
Problem-solving Approach	3.52	.72	Always
Guided Discovery Approach	3.49	.76	Always
Coaching Style	**3.44**	**.65**	**Always**

Badminton Coaching Competencies

Across domains, coaching competencies were rated high (composite mean = 3.35, SD = 0.61; 1–4 scale) as shown in Table 3. The highest domain scores were skills development (M = 3.49, SD = 0.74; Rank 1) and technique (M = 3.49, SD = 0.77; Rank 1), indicating frequent use of clear demonstrations, progressive drill design, and corrective feedback in badminton-specific training patterns consistent with reports that structured modules and technically proficient instruction enhance athlete performance (Ali & Siong, 2023; Fernandez, 2022). The construction of Character was ranked second in the survey by respondents, with a mean of 3.47 (SD = 0.67), indicating that the use of Values-based Practices supports the broader Sport Education Aims related to Moral Development and Life-Skills Development (Van Nieuwerburgh & Tong, 2012; Hambali et al., 2023). The Construction of Practice and Competition was ranked third, with a mean score of

3.43 (SD = 0.72), indicating Goal Setting, Safety Awareness, and Competition Readiness, consistent with evolving Competency Frameworks in Badminton Teaching (Du, 2025; Risjanna, Novan, Syihab, & Rimasa, 2025). The Motivational Competence mean score of 3.32 (SD 0.62) was still considered high; however, it was lower than that for Character, Practice, and Competition. This finding is consistent with the need for Individualised Strategies to enhance Autonomy-Supportive Communication and to Foster Psychological Needs (Huang, 2023; Tan, Shen, & Zhou, 2025). Finally, the respondents rated their Game Strategy Competence as moderate (M 2.93, SD 0.82), and represent an area with the least emphasis on Preparing for Competitive Badminton through Opponent Profiling, Decision Making During the Match, and Development of Individualised Tactical Game Plans (Edmizal, Rahman, Barlian, Donie, & Alnedral, 2024).

Table 3: The level of Coaching Competencies

Coaching Competencies	Overall Mean	Standard Deviation	Verbal Interpretation
Practice and Competition	3.43	.72	High level of competence
Game Strategy	2.93	.82	Moderate level of competence
Motivation	3.32	.62	High level of competence
Character Building	3.47	.67	High level of competence
Skills Development	3.49	.74	High level of competence
Technique	3.49	.77	High level of competence
Coaching Competencies	3.35	.61	**High level of competence**

Relationship between Coaching Styles and Coaching Competencies

Kendall's τ indicated a low, positive overall association between coaching styles and coaching competencies ($\tau = .294$, $p = .002$). At the style level, command showed significant correlations with practice & competition ($\tau = .315$, $p = .001$), motivation ($\tau = .299$, $p = .002$), character building ($\tau = .213$, $p = .021$), skills development ($\tau = .370$, $p < .001$), and techniques ($\tau = .350$, $p < .001$), but not game strategy ($\tau = .249$, $p = .071$). Reciprocal was likewise significant for practice & competition ($\tau = .284$, $p = .007$), motivation ($\tau = .277$, $p = .008$), character building ($\tau = .207$, $p = .049$), skills development ($\tau = .345$, $p = .001$), and techniques ($\tau = .268$, $p = .012$). At the same time, its association with game strategy was not statistically significant ($\tau = .475$, $p = .075$). In contrast, problem-solving and guided discovery were selectively related to the technical domains: problem-solving to skills development ($\tau = .314$, $p = .005$) and techniques ($\tau = .262$, $p = .012$); guided discovery to skills development ($\tau = .337$, $p = .002$) and techniques ($\tau = .260$, $p = .017$). No other problem-solving or guided discovery correlations were significant (all $p > .05$). Taken together, these results show that command and reciprocal styles exhibit broader links spanning practice management, motivation, character building, and technical instruction. In contrast, problem-solving and guided discovery are associated explicitly with technical skill growth (skills development and techniques). This pattern is consistent with competency-based views that pair directive and collaborative behaviors with wider psychosocial/organizational outcomes while leveraging inquiry- and autonomy-oriented methods to deepen technical proficiency (Fernandez, 2022; Risjanna, Novan, Syihab, & Rimasa, 2025; Huang, 2023; Edmizal, Rahman, Barlian, Donie, & Alnedral, 2024).

Table 4. The Relationship between Coaching Styles and Coaching Competencies

Coaching Styles	Coaching Competencies	Correlation Coefficient	P-VALUE	Verbal Interpretation
Command	Practice and Competition	.315**	.001	Low Positive, Significant
	Game Strategy	.249	.071	Negligible, Not Significant
	Motivation	.299**	.002	Low Positive, Significant
	Character Building	.213*	.021	Negligible, Significant
	Skills Development	.370**	.000	Low Positive, Significant
	Techniques	.350**	.000	Low Positive, Significant
Reciprocal	Practice and Competition	.284**	.007	Negligible, Significant
	Game Strategy	.475	.075	Low Positive, Not Significant
	Motivation	.277**	.008	Negligible, Significant

	Character Building	.207*	.049	Negligible, Significant
	Skills Development	.345**	.001	Low Positive, Significant
	Techniques	.268*	.012	Negligible, Significant
	Practice and Competition	.150	.168	Negligible, Not Significant
	Game Strategy	-.111	.306	Negligible, Not Significant
	Motivation	.124	.253	Negligible, Not Significant
Problem-solving	Character Building	.143	.185	Negligible, Not Significant
	Skills Development	.314**	.005	Low Positive, Significant
	Techniques	.262*	.012	Negligible, Significant
	Practice and Competition	.181	.093	Negligible, Not Significant
	Game Strategy	-.026	.811	Negligible, Not Significant
	Motivation	.177	.097	Negligible, Not Significant
Guided Discovery	Character Building	.178	.095	Negligible, Not Significant
	Skills Development	.337**	.002	Low Positive, Significant
	Techniques	.260*	.017	Negligible, Significant
The relationship between coaching styles and coaching competencies		**.294****	**.002**	**Low Positive, Significant**

CONCLUSION

This study provides an athlete-centered examination of badminton coaching in selected universities in Hunan Province, China, integrating four coaching styles (command, reciprocal, problem-solving, guided discovery) with six training competencies (practice & competition, game strategy, motivation, character building, skills development, technique). The respondents, predominantly young and highly experienced, reported frequent use of all coaching styles, with problem-solving and guided discovery most prominent and command least frequent, yet consistently present. The research indicated that coaching proficiency was high in skills development and technique, and that coaching performance was moderate in game strategy. The results suggested a hybrid collection of styles: instructors used both directive approaches and collaborative communication with autonomy support through knowledgeable inquiry, producing both strong psychosocial and technical outcomes, and indicated a need for more tactical pedagogy as a result of this hybrid approach. No sex differences were found in perceived coaching style or coaching competence, suggesting that both genders can employ effective coaching practices. Age and years of playing experience were identified as significant moderators of coaching style and competence among the participants; specifically, younger participants had higher ratings of coaching style and coaching competence than older participants, whereas participants with 10 or more years of playing experience had higher ratings of coaching competence than athletes with fewer than 10 years of experience, particularly for technical coaching domains. Additionally, correlations indicated that the overall association between coaching style and coaching competence was low but positive; command and reciprocal coaching styles were found to be most closely related to practice management, motivation, character development, and technique instruction, while problem-solving/guided discovery coaching styles were found specifically relevant to techniques and skills associated with technical growth. Collectively, these research findings substantiate a blended coaching style in university badminton and provide a framework for pairing coaching styles with technical and tactical coaching to optimize training and performance outcomes.

RECOMMENDATIONS

The Enhanced Coaching Training Program (ECTP) is a comprehensive approach that was designed to develop all aspects of a player. The program has 12 modules, but only involves 4 modules annually (1 per year) based on the player's readiness and the time of year (periodization). The modules focus on tactical flexibility and self-confidence, while coaching is grounded in values. The skills will be developed through a gradual, step-by-step process, using technical drills that match the players' readiness levels. The ECTP will provide assessment tools (observation rubrics, performance

logs, video analysis) to help track the player's development. In addition, the ECTP will ensure consistency across all age and experience levels in a player's training by developing cognitive skills and maintaining the athlete's holistic development. First, the focus is on the athlete; Second, all assessment tools used in this study are reliable; and Third, the methodological approach was appropriate for the ordinal data. The study uses a cross-sectional design; data were collected via self-report from a regional sample, which limits the generalizability of the findings. Future research on the ECTP will include concurrent evaluation of the ECTP in longitudinal/intervention studies; assessment of how the coaches' perceptions of their athletes and the athletes' actual performance relate through multiple assessments (objective vs. subjective); examination of specific strategy-task measures (e.g., profiling opponents, making decisions during games). The consensus of evidence indicates that coaching University Badminton through the versatility of Style and Competency Development is beneficial. By utilizing command and reciprocal behaviours to provide structure, discipline, motivation, and character, and using problem-solving and guided discovery methods to enhance technique and skills, with an additional focus on game strategies as separate instructional areas. Therefore, this combination of development methods, as demonstrated in the ECTP, has enabled coaches to enhance their coaching methods for University Badminton and provide student-athletes with a significant opportunity for success during the competitive phases of College Badminton.

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