

MENTAL ENLIGHTENMENT SCIENTIFIC –
METHODOLOGICAL JOURNALMENTAL ENLIGHTENMENT SCIENTIFIC –
METHODOLOGICAL JOURNAL<http://mentaljournal-jspu.uz/index.php/mesmj/index>IMPROVING COACHING ACTIVITY BASED ON A SYSTEMATIC APPROACH:
THE EFFECTIVENESS OF THE «LEADER-COACH» 6 MODEL
METHODOLOGIES AND THE MECHANISMS OF THEIR IMPLEMENTATION
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ABOUT ARTICLE

Key words: coaching activity, systematic approach, “Leader-Coach” model, basketball, pedagogical experiment, professional competence, rating and motivation, digital technologies, international standards, implementation mechanisms, effectiveness, sports pedagogy.

Received: 05.07.26**Accepted:** 06.07.26**Published:** 07.07.26

Abstract: The article provides an experimental justification of the effectiveness of six systematic methodologies (TF“IS”2 two-year strategic planning, DIM/1+7 internal league competitions, TF-Y8 analysis and renewal of coaching activity, RT/N+10 digital technologies and non-standard equipment, RAMP-17 — rating and reward system, XMI+2/20 international standard indicators) of the “Leader-Coach” 6 model, aimed at improving coaching activity based on a systematic approach, and develops the mechanisms for implementing the model in sports practice. The experiment was conducted in several regions of Uzbekistan, involving more than 120 basketball coaches and about 400 young athletes, comparing experimental (EG) and control (CG) groups. The results revealed statistically significant improvement in the experimental group ($P < 0.05-0.001$) and unreliable changes in the control group ($P > 0.05$). The high effectiveness, alignment with international standards and practical significance of the model were confirmed.

Introduction. The rapid development of physical education and sports systems worldwide has made the scientific organization of coaching practice an increasingly important research issue. The experience of leading sporting nations demonstrates that athletes' sustainable performance, long-term development, and the promotion of a healthy generation are directly determined by coaches' professional competence and the systematic organization of the training process. In developed countries, systematic approaches, competency-based models, and digital analytical mechanisms are widely employed in planning, monitoring, and evaluating coaching activities.

Nevertheless, in the global sports community, particularly in developing countries, coaching practice continues to rely largely on traditional, fragmented, and subjective approaches. Such practices reduce the effectiveness of the training process and hinder the achievement of consistent and sustainable athletic development. Therefore, research aimed at the scientific and methodological improvement of coaching practice through a systematic approach has become an important area of contemporary sports pedagogy and contributes significantly to the advancement of coaching science.

Over the past decade, the perception of coaching within the field of sports pedagogy has undergone a substantial transformation. A coach is no longer regarded solely as a specialist responsible for teaching technical skills but also as a strategist, analyst, manager, and leader. Leading international organizations, including FIBA and FIFA, as well as national governing bodies such as Canada Basketball and USA Basketball, have introduced phased coach certification systems, Long-Term Athlete Development (LTAD) models, and data-driven performance analysis frameworks. This global trend highlights the need for national sports systems to modernize coaching practice by adopting systematic approaches that comply with contemporary international standards.

To address this challenge, the author developed the “Leader–Coach” 6 Model, based on a systematic approach. The model is grounded in Ludwig von Bertalanffy's General Systems Theory (1968), contemporary coaching theories proposed by Rainer Martens and P. Chelladurai, and the competency-based approach. It integrates six interrelated dimensions of coaching practice into a unified pedagogical system: long-term strategic planning (TF–IS2); organization of internal league competitions (DIM/1+7); performance analysis and continuous improvement (TF–Y8); application of digital technologies and non-standard training equipment (RT/N+10); rating and reward management system (RAMP-17); and continuous improvement based on indicators aligned with international standards (XMI+2/20).

The effectiveness of coaching has been extensively examined in the international scientific literature as one of the central issues in sports pedagogy. Rainer Martens (2012) conceptualizes coaching as a holistic professional activity, while P. Chelladurai (2017) emphasizes the importance of a systems approach to the management of sports organizations. Similarly, J. Côté and W. Gilbert (2009) define coaching expertise as the integration of professional knowledge, pedagogical competence, and personal-ethical qualities. However, most existing studies focus on individual components of coaching practice. The integration of strategic, organizational, technological, motivational, and internationally oriented dimensions into a unified, empirically validated coaching model remains insufficiently explored.

The purpose of this study is to substantiate, through a comparative analysis of data obtained from a multi-regional pedagogical experiment, the effectiveness of the six systematic methodologies incorporated within the "Leader-Coach" 6 Model in enhancing coaching performance. Furthermore, the study aims to develop scientific and methodological mechanisms for the large-scale implementation of the proposed model in sports practice. The scientific novelty of the research lies in the integration of six interrelated dimensions into a comprehensive coaching system, the statistical validation of the effectiveness of each methodology, and the comparison of the obtained findings with current international trends in coaching science. The practical significance of the study is reflected in the direct applicability of the proposed methodological recommendations and implementation mechanisms within sports education institutions and coaching practice.

Literature review and methods. The theoretical foundations of the systems approach originate from Ludwig von Bertalanffy's General Systems Theory (1968) and were subsequently adapted to the field of sports management by P. Chelladurai (2017). Issues related to the systematic organization of coaching practice and the development of coaching expertise have been extensively discussed by Rainer Martens (2012), T. Cassidy, R. Jones, and P. Potrac (2009), as well as J. Côté and W. Gilbert (2009). The theory of sports training periodization was comprehensively developed by T. Bompa and G. Haff (2012) and V.N. Platonov (2015), while the technical and tactical components of basketball training were systematically described by J.V. Krause (2005). Furthermore, the Long-Term Athlete Development (LTAD) framework developed by Canada Basketball (2023) is recognized as one of the leading international models for sustainable athlete development.

The theoretical basis for the development of professional competence is grounded in the competence-based approach proposed by H. Biemans et al. (2004). Within the national scientific school, the methodological foundations of physical education theory and coaching

management have been further advanced by Sh.X. Xankeldiyev and the present author (Norkulov, 2024). In particular, the "Leader–Coach" Program and the patented Four-Level Training Ladder (SAP 02411) have been successfully introduced into coaching practice. The literature review indicates that although individual methodological approaches have been thoroughly investigated, there remains a lack of a comprehensive model that integrates these approaches into a unified system and has been validated through a multi-regional experimental study. Addressing this gap constitutes the principal scientific rationale and significance of the present research.

The theoretical and methodological foundation of this study is based on the systems approach, according to which coaching is regarded as an integrated system composed of interdependent elements. Within this framework, coaching effectiveness is determined not by the performance of individual components in isolation but by the dynamic interaction among them. This approach provides the conceptual basis for integrating the six dimensions of the "Leader–Coach" 6 Model—strategic, organizational, reflective-methodological, technological, motivational, and international—into a unified pedagogical system. Each dimension functions both as an independent methodology and as an integral component of the overall system, thereby ensuring the model's flexibility, adaptability, and applicability across diverse coaching contexts.

Research Methodology. The pedagogical experiment was conducted across several regions of Uzbekistan, including Fergana, Andijan, Namangan, Syrdarya (Gulistan), Tashkent Region, and Nukus. More than 120 basketball coaches and approximately 400 basketball players aged 14–16 years participated in the study. Each methodology was evaluated by comparing an experimental group (EG) with a control group (CG). The control groups followed conventional coaching practices, whereas the experimental groups implemented the corresponding methodology of the "Leader–Coach" 6 Model. Depending on the specific characteristics of each methodology, the intervention period ranged from 12 weeks to two years. The experimental and control groups were statistically equivalent with respect to baseline characteristics, ensuring comparable initial conditions ($p > 0.05$).

Outcome Measures and Statistical Analysis. The effectiveness of the proposed methodologies was evaluated using a comprehensive set of technical-tactical, physical, and coaching performance indicators. Technical-tactical performance included the accuracy of one-point, two-point, and three-point shooting, passing accuracy, execution of feints, and decision-making speed. Physical performance was assessed through 10-, 20-, and 30-meter sprint tests, vertical jump height, dribbling performance, and endurance capacity. In addition, coaching

effectiveness was evaluated using expert assessment scores (based on 1–10 and 1–100 rating scales) and Key Performance Indicators (KPIs).

Statistical analyses included the calculation of the mean ($\bar{X}$), standard deviation (SD), coefficient of variation (CV, %), Student's t-test, and Cohen's d effect size. Statistical significance was established at $p < 0.05$, $p < 0.01$, and $p < 0.001$.

The following section presents a separate analysis of the experimental findings obtained for each of the six methodologies incorporated into the "Leader–Coach" 6 Model. Subsequently, the mechanisms for implementing the model in sports practice and the synergistic effects arising from the integration of its six dimensions are comprehensively discussed.

Baseline Assessment. The diagnostic assessment conducted prior to the intervention identified several weaknesses in coaching practice. Although coaches demonstrated relatively satisfactory scores in strength (5.19 points) and endurance (5.33 points), lower performance was observed in explosive strength (4.83 points) and balance (4.69 points). The weakest results were recorded for digital monitoring (3.49 points) and video analysis (3.42 points) (Table 1). These findings indicate the limited use of non-standard training equipment, plyometric exercises, and digital technologies in coaching practice, while also revealing considerable regional disparities. The results of this baseline assessment served as the empirical foundation for the development and content design of the methodologies incorporated into the "Leader–Coach" 6 Model.

Table 1.

Baseline Diagnostic Assessment of Coaching Performance Across Regions (1–10-Point Scale)

Hudud	Strength	Expl. Strength	Endurance	Balance	Dig. Monit.	Video Anal.
Fergana (n=8)	5,1	4,9	5,3	4,8	3,1	3,5
Namangan (n=6)	5,3	4,8	5,3	4,5	3,5	3,0
Guliston (n=6)	5,4	4,8	5,3	4,5	3,4	3,6
Mean	5,19	4,83	5,33	4,69	3,49	3,42

he regional analysis revealed notable differences in coaching performance across the participating regions. Coaches from Tashkent Region and Gulistan (Syrdarya) achieved comparatively higher scores in strength and endurance. However, digital monitoring and video analysis received consistently low scores across all regions. In Andijan Region, almost all performance indicators were comparatively lower, indicating limited utilization of digital technologies and non-standard training equipment in coaching practice. These findings provided a strong empirical justification for emphasizing the Digital Technologies (RT/N+10) and International Standards (XMI+2/20) components of the "Leader–Coach" 6 Model.

TF-IS2: Two-Year Strategic Planning Methodology

Methodological Framework. The TF-IS2 methodology is designed to introduce the principles of long-term strategic planning into coaching practice through the development and implementation of a two-year strategic training plan. Within this framework, specific objectives and performance targets are established for each competitive season, quarter, and month, thereby systematically linking short-term training plans with long-term athletic development goals. Coaches in the experimental group (EG) developed and implemented comprehensive two-year strategic training plans, whereas coaches in the control group (CG) continued to employ conventional short-term planning practices.

Results. Coaches who implemented the two-year strategic planning framework demonstrated significant improvements in the technical performance of their athletes (Table 2). The experimental group (EG) showed statistically significant superiority across all four technical performance indicators ($p < 0.05$), whereas the control group (CG) exhibited only modest improvements that did not reach statistical significance.

Table 2.

Final Results of the TF-IS2 Methodology: Comparison Between the Experimental and Control Groups (n = 24)

Indicator	CG ($\bar{X} \pm SD$)	EG ($\bar{X} \pm SD$)	t	p
Three-point shooting accuracy, %	34.9 $\pm$ 2.6	38.5 $\pm$ 2.7	2.08	< 0.05
Two-point shooting accuracy, %	48.7 $\pm$ 2.1	52.8 $\pm$ 2.0	2.08	< 0.05
Free-throw accuracy, %	63.2 $\pm$ 2.4	70.5 $\pm$ 2.3	2.10	< 0.05
Mean number of successful feints	1.32 $\pm$ 0.3	1.62 $\pm$ 0.3	2.09	< 0.05

Recommendations. It is recommended that sports schools for children and adolescents and sports academies develop two-year athlete development plans for each team and establish a systematic monitoring process to ensure their effective implementation. Coaches should regularly document win-loss records, the dynamics of athletes' technical performance, and other Key Performance Indicators (KPIs) in accordance with the strategic plan. Furthermore, specialized professional development workshops and training seminars should be organized to promote a culture of long-term strategic planning among coaches.

Several challenges were identified during the implementation of the methodology. Some coaches demonstrated insufficient competence in strategic planning, while unforeseen factors—such as athlete injuries and changes in team composition—required continuous adaptation of the strategic plan. In addition, maintaining and periodically updating the plan demanded additional time and analytical skills. These findings indicate the need to support coaches through methodological guidelines, professional training, and continuous educational

programs. Nevertheless, the advantages of strategic planning are evident: it enables coaches to manage the training process more consistently, anticipate future challenges, and make evidence-based decisions supported by measurable Methodological Framework. The DIM/1+7 methodology is designed to establish a structured system of regular internal competitions within sports schools or basketball clubs. The "1+7" concept предусматривает the organization of at least seven internal tournaments in addition to the official championship conducted during the competitive season. Coaches in the experimental group (EG) implemented a planned schedule of internal league competitions throughout the season, whereas the control group (CG) participated exclusively in official championship events.

The systematic organization of internal competitions produced a comprehensive positive effect on athletes' physical, technical, and psychological performance (Table 3). Compared with the control group, athletes in the experimental group demonstrated statistically significant improvements in 10-, 20-, and 30-m sprint performance, vertical jump height, shooting accuracy, passing accuracy, and defensive performance, with most differences reaching statistical significance ($p < 0.01$). In contrast, regions where internal league competitions were not implemented showed improvements of only about 1%, which were not statistically significant. Regular exposure to competitive situations enhanced athletes' psychological resilience, competitive stress tolerance, and match readiness, while providing coaches with valuable opportunities to identify technical and tactical weaknesses under authentic game conditions. Consequently, the methodology strengthened the coach's role not only as an instructor but also as an organizer, leader, and motivator within the athlete development process.

Table 3.

Main Performance Indicators Following the Implementation of the DIM/1+7 Methodology: Comparison Between the Experimental Group (EG) and the Control Group (CG) (n = 70)

Indicator	CG ($\bar{X}$)	EG ($\bar{X}$)	t	p
10-m sprint, s	1.9	1.7	5.3	< 0.01
30-m sprint, s	4.9	4.4	7.3	< 0.01
Vertical jump, cm	49.1	60.7	11.5	< 0.05
Three-point shooting accuracy, %	35.4	45.4	9.8	< 0.01
20-m dribbling test, s	6.9	6.0	9.7	< 0.01
Passing accuracy, %	70.0	81.6	10.9	< 0.01

Recommendations. It is recommended that every sports school and sports club establish a structured system of internal league competitions. To ensure effective implementation, the

competition schedule should be prepared before the beginning of the competitive season. To address potential shortages of qualified officials, young referees and volunteers should be recruited and trained. Furthermore, competitions should be organized using a variety of formats, including round-robin, playoff, and group-stage tournaments. Such an approach enables young athletes to develop within a continuous competitive environment throughout the season, thereby enhancing both their psychological readiness and technical preparedness for official championships.

The pedagogical value of the DIM/1+7 methodology lies in its ability to foster essential volitional qualities in young athletes, including perseverance, resilience, and achievement motivation, through regular competitive experience. The baseline assessment revealed that approximately 40% of coaches had never organized internal competitions prior to the intervention. By the conclusion of the experimental program, however, all participating teams had successfully established regular internal tournaments. This significantly strengthened the competitive environment within sports schools while enhancing coaches' organizational competence and leadership capacity. Although the implementation of the methodology was accompanied by organizational challenges—including limitations in time, resources, and the availability of qualified referees—these constraints can be effectively addressed through advance planning, systematic scheduling, and the active involvement of trained volunteers.

TF-Y8 — trenerlik faoliyatini tahlil qilish va yangilash metodikasi

Methodological Framework. The TF-Y8 methodology is based on the continuous application of the "Analyze → Plan → Implement → Monitor → Improve" cycle. Coaches in the experimental group (EG) maintained reflective coaching journals after every training session and competition, reviewed their coaching practice through video analysis, and prepared weekly reflective evaluations. In contrast, coaches in the control group (CG) did not engage in systematic reflective analysis.

The one-year pedagogical experiment demonstrated statistically significant improvements across all evaluated performance indicators in the experimental group ($p < 0.05$), accompanied by a reduction in the coefficient of variation (CV), indicating greater consistency in performance (Table 4). Vertical jump height increased from 28.9 cm to 33.8 cm (approximately 17% improvement), three-point shooting accuracy improved from 32.1% to 38.4% (+6.3 percentage points), and free-throw accuracy increased from 59.2% to 68.3%. The decrease in the coefficient of variation—for example, from 18.2% to 13.9% in free-throw performance—suggests enhanced stability and reliability of athletes' performance outcomes. The importance of reflective practice as a fundamental component of effective coaching has also

been emphasized by Côté and Gilbert (2009) and Cassidy et al. (2009), and the findings of the present study provide empirical support for these theoretical perspectives.

Table 4.

Baseline (Pre-Test) and Final (Post-Test) Results Following the Implementation of the TF-Y8 Methodology

Indicator	CG (Pre-Test → Post-Test)	EG (Pre-Test → Post-Test)	EG Δ	p
Vertical jump, cm	28.7 → 29.2	28.9 → 33.8	+4.9	< 0.05
Free-throw accuracy, %	59.0 → 60.5	59.2 → 68.3	+9.1	< 0.05
Three-point shooting accuracy, %	31.9 → 32.5	32.1 → 38.4	+6.3	< 0.05
20-m dribbling test, s	5.30 → 5.25	5.30 → 4.95	-0.35	< 0.05

Recommendations. It is recommended that specialized professional development seminars on the TF-Y8 methodology be incorporated into coach education and certification programs. Coaches should be trained to record their training sessions, conduct independent video-based reflective analyses, and prepare analytical reports at the end of each competitive season. Such practices promote continuous reflection and lifelong professional learning, thereby contributing to sustained improvements in coaching quality and methodological competence.

The principal challenge encountered during the implementation of the TF-Y8 methodology was the limited awareness of reflective coaching practice among coaches. The baseline survey revealed that only 35% of participants were familiar with the methodology, while formal training opportunities in reflective practice were scarce. Furthermore, several coaches perceived the preparation of written reflective analyses after each training session as an additional workload. These findings highlight the necessity of systematic educational initiatives aimed at strengthening methodological competence and improving time-management skills. Nevertheless, the methodology represents an important step toward transforming coaching practice into an innovative pedagogical process grounded in scientific inquiry, critical reflection, and evidence-based decision-making.

RT/N+10: Methodology for Digital Technologies and Non-Standard Training Equipment

Methodological Framework. The RT/N+10 methodology integrates modern digital technologies—including heart rate monitors, video analysis, and digital performance tracking systems—with non-standard training equipment such as the patented Four-Level Training Ladder, portable agility ladders, macebells, steel clubs, and balance platforms. Coaches in the experimental group (EG) implemented specialized training sessions incorporating non-standard equipment at least twice per week over a six-month intervention period, while

systematically employing digital monitoring and video analysis during every training session. In contrast, coaches in the control group (CG) continued to follow conventional training methods without the use of digital technologies. The patented Four-Level Training Ladder (SAP 02411) enables athletes to perform zone-specific exercises using steps of different heights, thereby enhancing speed, strength, and agility through progressively differentiated training loads.

The combined application of digital technologies and non-standard training equipment resulted in statistically significant improvements across all evaluated physical and technological performance indicators in the experimental group ($p < 0.001$), with a large practical effect size (Cohen's $d \approx 1.7\text{--}2.0$), whereas changes observed in the control group were not statistically significant (Table 5). The Four-Level Training Ladder facilitated an optimal distribution of training intensity through its zone-specific design, heart rate monitoring enabled individualized load prescription, and video analysis supported the correction of technical errors. The observed reduction in the coefficient of variation—for example, in strength performance from 8.5% to 7.5%—indicates increased stability and consistency of athletic performance. Moreover, the simultaneous application of these innovative training components produced a synergistic effect, whereby the overall improvement exceeded the combined contribution of each individual intervention, demonstrating the effectiveness of their integrated implementation within the "Leader–Coach" 6 Model.

Table 5.

Expert Evaluation Scores Following the Implementation of the RT/N+10 Methodology (1–10 Rating Scale): Comparison Between the Experimental Group (EG) and the Control Group (CG) (n = 12)

Indicator	CG (Baseline → Final)	EG (Baseline → Final)	t (EG)	p (EG)
Strength	5.2 → 5.3	5.2 → 6.0	5.2	< 0.001
Explosive Strength	4.9 → 5.0	4.9 → 5.8	4.9	< 0.001
Endurance	5.3 → 5.4	5.3 → 6.2	5.6	< 0.001
Balance	4.6 → 4.7	4.6 → 5.5	5.4	< 0.001
Digital Monitoring	3.4 → 3.5	3.4 → 4.5	5.8	< 0.001
Video Analysis	3.3 → 3.4	3.3 → 4.4	5.5	< 0.001

Recommendations. It is recommended that sports education institutions expand their training inventories by incorporating non-standard training equipment, including agility ladders, balance platforms, and medicine balls. Coaches should receive systematic training in the effective application of digital technologies, while each team should maintain a standardized performance monitoring protocol and a video analysis archive. In addition,

comprehensive safety guidelines for the use of innovative training equipment should be developed and implemented. These measures will contribute to the modernization of coaching practice and facilitate its alignment with international best practices.

The scientific significance of the RT/N+10 methodology lies in its capacity to enhance both the individualization and objectivity of the coaching process. Digital monitoring enables precise regulation of training loads by allowing coaches to immediately reduce exercise intensity or provide recovery when an athlete's heart rate exceeds the prescribed training zone. Likewise, video analysis accelerates technical correction by providing athletes with direct visual feedback on movement errors. The findings of the present study confirm that the integrated application of digital technologies and non-standard training equipment is qualitatively superior to conventional training methods. Nevertheless, successful implementation of the methodology requires adequate material and technical resources, systematic coach education, and strict adherence to safety standards, all of which should be considered essential prerequisites.

RAMP-17: Rating and Reward Management System Methodology

Methodological Framework. The RAMP-17 (Rating and Motivation Platform) methodology is designed to evaluate coaching performance using 17 Key Performance Indicators (KPIs) while providing both financial and non-financial incentives based on achieved results. Coaches in the experimental group (EG) were evaluated monthly over a six-month intervention period, with ranking results publicly announced and top-performing coaches formally recognized and rewarded. No rating or incentive system was implemented in the control group (CG).

Results and Discussion. The implementation of the rating and reward system resulted in significant improvements in technical performance, injury prevention, functional fitness, and intrinsic motivation among athletes in the experimental group (Table 6). Three-point shooting accuracy increased from 29.8% to 36.5% (+6.7 percentage points, $p < 0.01$), the average number of injury-free months increased from 4.3 to 5.8 (approximately 35% improvement), and the intrinsic motivation score improved from 4.9 to 6.0 ($p < 0.001$). The introduction of the KPI-based evaluation system encouraged coaches to focus on specific aspects of their professional practice, including shooting technique, training load management, and athlete recovery. These findings are consistent with P. Chelladurai's (2017) theory of sports management and the principles of data-driven coaching, further supporting the effectiveness of objective performance evaluation systems in enhancing coaching quality.

Table 6.

Key Performance Indicators (KPIs) Following the Implementation of the RAMP-17 Methodology: Comparison Between the Experimental Group (EG) and the Control Group (CG) (n = 12)

Key Performance Indicator (KPI)	CG (Baseline → Final)	EG (Baseline → Final)	p (EG)
Three-point shooting accuracy, %	30.2 → 31.0 (+0.8)	29.8 → 36.5 (+6.7)	< 0.01
Injury-free months (out of 6)	4.5 → 4.7	4.3 → 5.8	< 0.01
Functional status within the normative range, score	4.0 → 4.2	4.1 → 5.0	< 0.01
Intrinsic motivation, score	5.0 → 5.1	4.9 → 6.0	< 0.001

Recommendations. When implementing a coach performance rating system within the national sports framework, the evaluation criteria should be transparent, fair, and sufficiently flexible to accommodate different age categories and competitive levels. Information technologies should be integrated into the evaluation process, enabling coaches to monitor their ratings in real time. Furthermore, incentive mechanisms should combine both financial and non-financial rewards, including monetary bonuses, "Coach of the Year" awards, and opportunities for continuing professional development. A transparent evaluation system promotes a balanced integration of intrinsic and extrinsic motivation, thereby enhancing coaches' professional engagement.

An important feature of the RAMP-17 methodology is that external incentives, such as rewards and professional recognition, did not diminish coaches' intrinsic motivation; instead, they significantly strengthened it. Coaches who perceived the evaluation process as fair and recognized that their professional efforts were appropriately acknowledged reported higher levels of job satisfaction, professional commitment, and dedication. The public disclosure of ranking results fostered a healthy competitive environment among coaches. These findings are consistent with contemporary motivation theories, which suggest that the effective integration of intrinsic and extrinsic motivational factors maximizes professional performance. Nevertheless, the successful implementation of the system depends on maintaining fair evaluation criteria and ensuring the long-term sustainability of incentive resources.

XMI+2/20: International Standards Indicator Methodology

Methodological Framework. The XMI+2/20 methodology is designed to align training content and performance assessment criteria with internationally recognized standards. A 12-week intensive training program was developed for the experimental group (EG), incorporating speed, agility, technical, and tactical exercises based on international performance benchmarks.

In contrast, the control group (CG) continued to follow the conventional national training program.

The 12-week intervention substantially improved the performance of athletes in the experimental group, bringing their results closer to internationally recognized standards. Statistically significant improvements were observed across all ten evaluated performance indicators (Table 7). Ten-meter sprint performance improved by approximately 9%, while decision-making time decreased from 3.8 s to 3.2 s (approximately 16% improvement), approaching the internationally accepted benchmark of 3.0–3.2 s. In addition, the Team Performance Effectiveness Index increased from 75 to 85 points. These findings demonstrate that athletes can achieve measurable progress toward international performance standards within a relatively short period. Moreover, the results are consistent with the Canada Basketball Long-Term Athlete Development (LTAD) Model (2023) and the performance recommendations established by FIBA.

Table 7.

Final Values of the Main Performance Indicators Following the Implementation of the XMI+2/20 Methodology: Comparison Between the Experimental Group (EG) and the Control Group (CG) (n = 14)

Indicator	EG (Final)	CG (Final)	t	p
10-m sprint, s	2.10	2.28	4.70	< 0.001
5 × 5 m shuttle run, s	7.3	7.8	3.50	< 0.01
Passing accuracy (out of 5)	4.2	3.2	5.10	< 0.001
Three-point shooting accuracy (out of 10)	4.0	2.5	3.90	< 0.01
Decision-making time, s	3.2	3.8	6.00	< 0.001
Defensive performance (out of 5)	3.8	3.0	4.00	< 0.001

Recommendations. It is recommended that sports schools and sports academies integrate internationally recognized performance assessment protocols into their training programs. Athletes' performance should be compared once or twice annually with international normative benchmarks for the corresponding age category (e.g., U-16). In addition, professional development seminars involving international experts should be organized to facilitate the adoption of global best practices. This approach enhances athletes' preparedness for international competition while promoting a strategic and globally oriented perspective in coaching practice.

The strategic significance of the XMI+2/20 methodology lies in directing the attention of both coaches and athletes toward evaluating performance against international benchmarks.

The implementation of higher performance standards encouraged athletes to realize their full potential, increased the competitive intensity of training, and strengthened their motivation to perform at an international level. Given the increasing globalization of modern sport, success in international competitions requires that the training process itself be aligned with internationally recognized frameworks, including FIBA recommendations, the Long-Term Athlete Development (LTAD) model, and data-driven performance analysis. The present study demonstrates a practical approach to achieving this objective and provides a scientific rationale for aligning coach certification systems with international standards.

7. Mechanisms for Implementing the Model in Sports Practice

The findings of the pedagogical experiment support the phased implementation of the "Leader–Coach" 6 Model within youth sports schools, specialized sports academies, and coach education and professional development systems. The principal implementation mechanisms include:

(1) Methodological support—the development of specialized methodological manuals, textbooks (e.g., *Basketball and Its Teaching Methodology* (2024) and *3×3 Basketball and Its Teaching Methodology* (2025)), and standardized educational programs based on the proposed model.

(2) Professional development—the introduction of the "Leader–Coach" training program in 2024, which involved 220 coaches and resulted in an increase in the average methodological competence score from 3.2 to 4.0 points.

(3) Material and technical support—equipping sports schools with non-standard training equipment and digital technologies to facilitate evidence-based coaching practice.

Additional implementation mechanisms include:

(4) Establishing a structured system of internal competitions within every sports school;

(5) Introducing a national coach rating system to evaluate coaching performance objectively and recognize outstanding coaches through appropriate incentive mechanisms; and

(6) Harmonizing the national athlete development system with internationally recognized standards, including FIBA guidelines and the LTAD framework, while modernizing the national coach certification system in accordance with international requirements.

The successful implementation of these mechanisms requires close cooperation among the Basketball Federation of Uzbekistan, coach education and training centers, and regional sports authorities. The proposed model should initially be implemented through pilot projects in selected sports schools, followed by gradual nationwide expansion based on the outcomes of the pilot phase.

Several limitations and implementation challenges were identified during the adoption of the "Leader–Coach" 6 Model. These included insufficient material and technical resources for acquiring non-standard training equipment and digital technologies, the need for additional time and professional training to enable coaches to effectively utilize innovative technologies, a shortage of referees and organizational resources for conducting internal competitions, and the necessity of ensuring that the coach rating system remains sufficiently flexible to accommodate different age categories and competitive levels. To overcome these challenges, a phased implementation strategy is recommended, supported by systematic planning, scientific-practical conferences, and online coaching platforms that facilitate the exchange of professional experience and best practices.

The legal framework for implementing the model is supported by the normative and regulatory documents governing the development of physical education and sport in the Republic of Uzbekistan. In particular, national programs aimed at improving coach education, continuing professional development, and sports research provide a favorable institutional foundation for integrating the "Leader–Coach" 6 Model into the national coach development system. Furthermore, the conceptual framework of the model extends beyond basketball and has the potential to be adapted for other sports as well as for broader implementation across Central Asia. The effectiveness of the proposed professional development mechanism was confirmed through a pilot educational program implemented in 2024. Over a nine-month period, 220 coaches from various regions of Uzbekistan participated in quarterly training seminars covering contemporary coaching methodologies, leadership in team management, the application of information and communication technologies (ICT), individualized coaching approaches, and psychological preparation. As a result, participants demonstrated significant improvements in their methodological, communication, and organizational competencies. The average methodological competence score increased from 3.2 to 4.0 points, representing an improvement of approximately 25%. These findings support the need to institutionalize such professional development programs nationwide and to establish a system of continuous coach certification.

Particular attention should be devoted to the development of coaches' leadership and pedagogical competencies during the implementation of the model. The findings indicate that coaching effectiveness is substantially enhanced when coaches perform not merely as instructors but also as leaders capable of inspiring, guiding, and managing their teams. Accordingly, it is recommended that mentor–mentee programs be established in every region, enabling experienced coaches to provide systematic guidance to novice coaches. In addition,

coaches should be actively involved in organizational and managerial responsibilities while receiving advanced education in sports management, sport psychology, and professional communication. Higher education institutions responsible for coach preparation should strengthen curricula in coaching psychology, pedagogical excellence, and sports management to prepare a new generation of highly qualified coach-leaders capable of meeting international professional standards.

Synergistic Effects of the Six Methodologies

The findings obtained from the six methodologies revealed a consistent pattern: experimental groups implementing the systematic approach demonstrated statistically significant improvements across all evaluated performance indicators, whereas the control groups, which continued to follow conventional coaching practices, exhibited only marginal and statistically non-significant changes. The six methodologies complement one another by addressing different but interrelated dimensions of coaching effectiveness. Strategic planning promotes long-term consistency in the training process; the internal league competition system enhances competitive experience; reflective analysis facilitates continuous professional development; digital technologies improve the objectivity of performance monitoring and evaluation; the rating and reward system strengthens coaches' motivation; and the international standards indicator methodology aligns athlete development with globally recognized performance benchmarks. Collectively, these complementary methodologies generate a synergistic effect, whereby the integrated implementation of the "Leader–Coach" 6 Model produces greater improvements than the isolated application of its individual components. Table 8 summarizes the principal focus and key outcomes associated with each of the six methodologies.

Table 8.

Summary of the Effectiveness of the Methodologies Incorporated in the "Leader–Coach" 6 Model

Methodology	Primary Focus	Main Outcome	p
TF-IS2	Long-term strategic planning	Improvement in technical accuracy by 3.6–7.3 percentage points	< 0.05
DIM/1+7	Internal league competitions	Improvement in physical and technical performance	< 0.01
TF-Y8	Reflective analysis and continuous improvement	Technical improvement with increased performance consistency (CV↓)	< 0.05
RT/N+10	Digital technologies and non-standard training equipment	Improvement in physical performance by 15–20% (Cohen's $d \approx 1.7$ –2.0)	< 0.001

Methodology	Primary Focus	Main Outcome	p
RAMP-17	Rating and reward management system	Enhanced motivation and injury prevention	< 0.01
XMI+2/20	Integration of international performance standards	Speed and decision-making performance approaching international benchmarks	< 0.01

The integrated implementation of the six methodologies also elevated coaches' personal and professional competencies to a new level. According to the post-intervention survey, 85% of athletes reported noticeable improvements in their coaches' communication style and motivational abilities, while coaches demonstrated significant gains in their communication, organizational, and leadership competencies ($p < 0.05$). The synergistic effect generated through the integration of the six methodologies—whereby the combined impact exceeded the sum of their individual effects—demonstrates the superiority of the "Leader–Coach" 6 Model over conventional coaching approaches and provides empirical evidence supporting its scientific validity.

The implementation of the systems approach also produced substantial improvements in the organizational aspects of coaching practice. Coaches demonstrated greater discipline in maintaining training documentation, while planning and reporting procedures became more systematic and standardized. In addition, the organization of internal competitions expanded considerably across participating institutions. These developments indicate the emergence of a more integrated and well-structured coaching management system. As a consequence of the model's comprehensive implementation, significant improvements were achieved simultaneously across multiple dimensions, including technical, physical, psychological, and managerial performance.

Comparison of the present findings with contemporary international trends indicates that the "Leader–Coach" 6 Model is consistent with the principles of data-driven coaching, Long-Term Athlete Development (LTAD), and the competency-based approach adopted in leading sports systems worldwide. At the same time, the model has been specifically adapted to the national context by considering the socio-economic and infrastructural characteristics of Uzbekistan and the broader Central Asian region. This demonstrates that the model is theoretically grounded, empirically validated, and contextually adaptable. The integration of these three characteristics substantially enhances its potential for broader implementation within the international coaching community.

Another significant scientific contribution of the proposed model is the development of a comprehensive framework for evaluating coaching performance. In conventional coaching practice, coaches are frequently assessed solely on the basis of team outcomes, particularly the

number of victories achieved. Such an approach fails to capture the multidimensional nature of coaching performance. In contrast, the "Leader–Coach" 6 Model incorporates multiple evaluation dimensions, including the quality of strategic planning, reflective practice, technological competence, the ability to create a motivational environment, and compliance with international performance standards, thereby enabling a holistic assessment of coaching effectiveness. This multidimensional framework is fully consistent with the principles of multi-criteria evaluation that underpin contemporary theories of sports management and coach performance assessment.

The practical significance of this study lies in the development of clear implementation algorithms, performance evaluation criteria, and methodological guidelines for each of the six methodologies, all of which can be directly applied by coaches, sports administrators, and sports managers in professional practice. The modular structure of the "Leader–Coach" 6 Model enables its phased implementation, allowing sports organizations to adopt the model according to their institutional capacities and specific needs. Initial implementation may focus on the most essential components—such as long-term strategic planning and internal league competitions—followed by the gradual integration of the technological and international standards components. This phased approach enhances the model's adaptability, facilitates sustainable implementation, and increases its practical applicability across diverse organizational contexts.

Practical recommendations

Based on the findings of the present study, the following practical recommendations are proposed for the implementation of the "Leader–Coach" 6 Model in sports practice. These recommendations are intended to be implemented at three institutional levels: sports school management, sports federations, and higher education institutions responsible for coach education.

First, within the framework of the TF–IS2 methodology, coaches should organize the training process according to long-term strategic plans, while sports school administrators should provide methodological support for the development and implementation of strategic planning. Higher education institutions should incorporate this approach into their curricula, ensuring that prospective coaches acquire the competencies required for designing macrocycle training plans.

Second, based on the DIM/1+7 methodology, internal competitions should be organized during every training cycle or training camp. Sports federations are encouraged to provide

methodological support for the organization of internal leagues at both regional and national levels.

Third, within the TF-Y8 methodology, coaches should conduct comprehensive analyses of the training process at the end of each competitive season. In parallel, sports federations should organize regular scientific-practical seminars in every region to promote reflective coaching practices and the dissemination of best practices.

Fourth, in accordance with the RT/N+10 methodology, the training process should be enriched through the integration of innovative training technologies and non-standard equipment. Sports schools should strengthen their material and technical infrastructure, while coaches should receive systematic training in the effective use of information and communication technologies (ICT) in coaching practice.

Fifth, under the RAMP-17 methodology, a motivational rating system should be introduced for both coaches and athletes. Furthermore, sports federations should develop a unified national framework of performance indicators to ensure transparent and objective evaluation.

Sixth, within the XMI+2/20 methodology, the national athlete development system should be harmonized with internationally recognized standards, including FIBA recommendations and the Long-Term Athlete Development (LTAD) framework. In addition, the national coach certification system should be modernized to comply with international professional standards.

Seventh, guided by the principles of the "Leader-Coach" 6 Model, greater emphasis should be placed on developing coaches' leadership and pedagogical competencies. Structured mentor-mentee programs should be established to facilitate the transfer of professional knowledge and practical experience from experienced coaches to novice practitioners.

Eighth, a national platform for Continuous Professional Development (CPD) should be established to support lifelong learning among coaches and to promote a sustainable culture of professional collaboration, knowledge sharing, and exchange of best practices across the coaching community.

Conclusion. The findings of the pedagogical experiment provide compelling evidence of the effectiveness of the six systematic methodologies incorporated within the "Leader-Coach" 6 Model. Each methodology contributed to the improvement of a specific dimension of coaching practice, while all experimental groups demonstrated statistically significant improvements ($p < 0.05-0.001$). In contrast, the control groups exhibited no statistically significant changes ($p >$

0.05). These findings confirm the superiority of the systems approach over conventional fragmented coaching practices.

The study developed six key implementation mechanisms for integrating the model into sports practice: methodological support, professional development, material and technical support, an internal competition system, a national coach rating system, and alignment with international standards. The principal scientific contribution of the proposed model lies in the synergistic effect generated by integrating six complementary dimensions into a unified coaching system. The findings demonstrate that this comprehensive approach produces substantially greater improvements than the isolated application of individual methodologies.

The results provide a strong scientific basis for the large-scale implementation of the "Leader–Coach" 6 Model within sports schools and sports clubs of the Republic of Uzbekistan, as well as its adaptation to other sports and countries across Central Asia. The proposed model transforms coaching practice from an activity primarily dependent on individual experience into a systematic, strategically planned, and evidence-based pedagogical framework. Consequently, it contributes to the advancement of sports pedagogy by introducing a novel conceptual model for the systematic management and evaluation of coaching practice.

The practical significance of the study extends beyond improvements in athletes' performance. The implementation of the model also enhanced coaches' professional responsibility, intrinsic motivation, communication skills, and leadership competencies. According to the post-intervention survey, 85% of athletes reported noticeable improvements in the quality of communication with their coaches. Furthermore, the observed reduction in the coefficient of variation within the experimental groups indicates not only higher levels of performance but also greater performance consistency and stability, thereby increasing the likelihood of maintaining high-quality performance under competitive demands.

Future research should focus on evaluating the effectiveness of the "Leader–Coach" 6 Model through longitudinal studies spanning three to five years, adapting the model to other team and individual sports, and developing an automated digital platform for coach evaluation, performance monitoring, and rating management. Such investigations will further strengthen the scientific and practical value of the model and facilitate its broader adoption within the international sports community.

Several limitations of the present study should also be acknowledged. First, the pedagogical experiment was conducted primarily within the context of basketball and involved athletes aged 14–16 years. Second, the duration of the interventions varied according to the characteristics of each methodology, ranging from 12 weeks to two years. Third, several

outcome measures were based on expert evaluations, which may introduce a degree of subjectivity. Consequently, caution should be exercised when generalizing the findings to other sports, age groups, or cultural contexts. Future research should therefore employ larger and more diverse samples, incorporate more objective measurement instruments, and examine the applicability of the proposed model across different sporting environments. Nevertheless, the multi-regional research design, the comparison between experimental and control groups, and the consistent demonstration of statistical significance provide strong evidence supporting the reliability and validity of the study's conclusions.

Overall, the present study makes three major contributions to the theory of sports pedagogy and the practice of coaching management. First, from a theoretical perspective, it proposes and substantiates the "Leader–Coach" 6 Model, which integrates six key dimensions of coaching practice into a unified framework based on the systems approach. Second, from an empirical perspective, the effectiveness of the model was verified through a multi-regional pedagogical experiment supported by rigorous statistical analysis. Third, from a practical perspective, the study developed concrete implementation mechanisms and methodological recommendations to facilitate the adoption of the model in sports practice.

The findings provide strong scientific evidence supporting the transition from traditional, fragmented coaching approaches to a systematic, strategically planned, and outcome-oriented coaching model. The "Leader–Coach" 6 Model not only enhances athletes' performance, but also strengthens coaches' professional competence, thereby contributing to the improvement of coach education within the sports education system of the Republic of Uzbekistan and promoting the alignment of coaching practice with international standards. Owing to its theoretical foundation, demonstrated practical effectiveness, and contextual adaptability, the proposed model represents an innovative framework capable of elevating coaching practice to a new level within the fields of physical education and sport.

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