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T-shaped model of professional competence of sports coaches for interdisciplinary development

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***Abstract:** The article provides a theoretical and methodological analysis of the problem of developing the professional competence of sports coaches in the context of the transformation of modern high-performance sport. It is substantiated that the increasing complexity of the organizational structure of athlete preparation, the emergence of multidisciplinary support teams, and the functioning of coaching activity in a VUCA environment necessitate a revision of traditional approaches to the professional role of the coach. It is demonstrated that the model of the coach as a “universal practitioner” no longer meets contemporary requirements for performance efficiency, effectiveness, and sustainable athlete development.*



The purpose of the article is to generalize existing scientific approaches to the concept of the T-shaped professional and to develop a universal T-shaped model of professional competence for sports coaches that can be applied across different sports. The methodological framework of the study includes analysis and synthesis of scientific literature, expert interviews with coaches possessing at least five years of practical experience, and systematization of the authors' professional coaching experience.

The article traces the evolution of the T-shaped professionalism concept from management and design thinking to the field of sports coaching and establishes its consistency with integrative models of coaching effectiveness. Based on the results of the expert survey, a set and hierarchy of key competencies of the modern coach are identified, including ethical, sport-specific, communicative, organizational, pedagogical, psychological, and medical-biological competencies. A T-shaped model of professional competence is proposed, reflecting the required balance between the depth of specialized knowledge and the breadth of interdisciplinary and integrative skills.

The developed model is considered a universal baseline framework that can be adapted to the specific characteristics of particular sports and applied within systems of professional training, continuing education, and lifelong development of sports coaches, as well as serving as a methodological foundation for further research in the theory and methodology of sports training.

Keywords: *T-shaped professional, sports coaching, competence model, interdisciplinary collaboration, soft skills, athlete development, high-performance management, transdisciplinary practice.*



T-подібна модель професійної компетентності тренерів з видів спорту для міждисциплінарного розвитку

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***Анотація:** У статті здійснено теоретико-методологічний аналіз проблеми формування професійної компетентності спортивних тренерів у контексті трансформації сучасного спорту високих досягнень. Обґрунтовано, що ускладнення організаційної структури підготовки спортсменів, поява мультидисциплінарних команд супроводу та функціонування тренерської діяльності в умовах VUCA-середовища зумовлюють необхідність перегляду традиційних підходів до професійної ролі тренера. Показано, що модель тренера як «універсального виконавця» не відповідає сучасним вимогам результативності, ефективності та сталого розвитку спортсмена.*

Метою статті є узагальнення наявних наукових підходів до концепції T-подібного фахівця та розроблення універсальної T-подібної моделі професійної компетентності спортивного тренера, придатної для застосування в різних видах спорту. Методологічну основу дослідження становлять аналіз і синтез наукових джерел, метод експертних інтерв'ю з тренерами, які мають не менше



п'яти років практичного досвіду, а також систематизація авторського тренерського досвіду.

У статті простежено еволюцію концепції T-подібної професійності від менеджменту та дизайн-мислення до сфери спортивного коучингу, встановлено її відповідність інтегративним моделям ефективності тренерської діяльності. На основі результатів експертного опитування визначено перелік і ієрархію ключових компетентностей сучасного тренера, зокрема етичної, професійно-спеціальної, комунікативної, організаційної, педагогічної, психологічної та медико-біологічної. Запропоновано T-подібну модель професійної компетентності, що відображає необхідний баланс між глибиною спеціалізованих знань і широтою міждисциплінарних та інтегративних умінь. Розроблена модель розглядається як універсальний базовий каркас, який може бути адаптований до специфіки окремих видів спорту та використаний у системі професійної підготовки, підвищення кваліфікації й безперервного розвитку спортивних тренерів, а також слугувати методологічною основою для подальших наукових досліджень у галузі теорії та методики спортивного тренування.

Ключові слова: *T-подібний фахівець, спортивний коучинг, модель компетентностей, міждисциплінарна співпраця, м'які навички, розвиток спортсменів, управління високими досягненнями, трансдисциплінарна практика.*

Problem statement. The professionalization of global sport over the last three decades has precipitated a fundamental paradigm shift in the functional role of the sports coach. Historically, the coach was viewed as a solitary craftsman and a "jack of all trades" responsible for the totality of an athlete's preparation, ranging from fitness conditioning and technical instruction to strategic planning and psychological mentorship. However, the modern high-performance environment, characterized by



what the military and business sectors term a VUCA (Volatile, Uncertain, Complex, and Ambiguous) area, has rendered this solitary model obsolete.

The contemporary coach now operates within a hyper-specialized ecosystem, surrounded by a huge number of support staff including biomechanists, performance analysts, nutritionists, strength and conditioning coaches, and sports psychologists. While this proliferation of expertise offers the potential for great precision in athlete development, it simultaneously creates a fragmentation of knowledge that can lead to disjointed and ineffective practice.

This fragmentation, often referred to as the "silo effect," poses a significant challenge to performance outcomes. When specialists operate in isolation, focusing exclusively on their narrow domain of expertise, the athlete is at risk of being treated as a collection of disparate physiological systems rather than a holistic human being. A strength coach may prescribe a loading protocol that conflicts with the technical coach's tactical periodization, or a nutritionist's rigid plan may undermine a psychologist's intervention on anxiety. To remove these disciplinary divides, the concept of the "T-Shaped Professional" has emerged as a potentially effective theoretical framework.

Additionally, when searching for development pathways, many coaches face uncertainty regarding which skills to acquire and improve. This creates the need for a clear and universal T-shaped framework that would be applicable to coaches in all kinds of sports.

Originally conceptualized in the context of organizational management and later popularized in design thinking, the T-shaped professional possesses a unique duality: a vertical depth of expertise in a specific domain, allowing them to make substantive technical contributions, and a horizontal breadth of generalist skills, enabling collaboration, translation, and synthesis across disciplines.

Analysis of recent research and publications. The metaphor of the T-shaped professional first originated in the corporate quest to solve the challenges of



specialization. The term was first explicitly coined by David Guest in a 1991 article for The Independent titled “The hunt is on for the Renaissance Man of computing” [1]. David Guest described a critical skills gap in the information technology sector of that time. He identified a need for a "hybrid manager" who combined deep technical expertise (the vertical bar) with business acumen and interpersonal skills (the horizontal bar). Guest’s analysis was a response to the "silo" mentality where IT specialists could not effectively communicate with the broader business organization, leading to expensive technological solutions that failed to meet organizational needs.

The concept remained relatively dormant until it was revitalized and popularized in the 2010s by Tim Brown, the CEO of the design consultancy firm IDEO [2]. Brown used the T-shaped metaphor to describe the ideal employee for interdisciplinary creative collaboration. In Brown's formulation, the vertical bar represents depth of skill in a single field like engineering or industrial design, which allows the individual to contribute high-quality value to the creative process. The horizontal bar, conversely, represents the disposition for collaboration across disciplines. This includes empathy, curiosity, and the ability to listen and integrate perspectives from fields other than one's own. For Brown, T-shaped individuals were essential because they could "stand in the shoes of others" while maintaining their own distinct expert identity.

In sports coaching, the T-shaped competence concept gained significant traction through the works of Kevin Bowring at the Rugby Football Union (RFU). Bowring, tasked with developing elite coaches, identified that the professionalization of rugby required a new type of practitioner. The modern rugby coach needed to be an expert in the technicalities of the sport: the scrum, the lineout, the breakdown. But, at the same time, the expert had to be also capable of managing a diverse support staff. Bowring explicitly characterized this as the "T-shaped coach" dilemma: the tension between maintaining deep specialist knowledge (vertical) while developing the breadth (horizontal) required to lead a holistic high-performance program [3]. This adaptation of the model acknowledges that in high-performance sport, no single individual can



possess vertical depth in all necessary areas. Thus, the horizontal bar becomes the mechanism for accessing and leveraging the depth of others.

To validate the T-shaped model within sports science, it must be reconciled with established definitions of coaching effectiveness. The most complete academic framework in this domain is Côté and Gilbert's (2009) "Integrative Definition of Coaching Effectiveness and Expertise" [4]. Côté and Gilbert define coaching effectiveness as "the consistent application of integrated professional, interpersonal, and intrapersonal knowledge to improve athletes' competence, confidence, connection, and character in specific coaching contexts". This definition provides a tripartite structure of knowledge that maps directly onto the T-shaped framework:

1. Professional knowledge: this corresponds to the Vertical Bar. It covers the "Hard Skills" of the sport like specialized knowledge of the subject matter, sport-specific techniques, tactical systems, and pedagogical content knowledge.
2. Interpersonal knowledge: this corresponds to the Horizontal Bar. It includes the "Soft Skills" required for interaction like communication, leadership, empathy, and the ability to connect with athletes and staff.
3. Intrapersonal knowledge: this also resides on the Horizontal Bar. It refers to the capacity for introspection, reflection, and self-regulation. It is the engine of the "Adaptive Innovator," allowing the coach to understand their own biases, values, and limitations, and to adapt their approach to the specific context.

Barile et al. (2023) use the term "T-shaped professional" to represent this competence framework, defining two dimensions [5]. The first is the vertical dimension which signifies hard skills, representing depth of expertise and "teachable skills or skill sets". The second is the horizontal dimension, signifying breadth of cross-sectional capacity. This dimension allows professionals to understand multiple disciplines and systems, benefiting their overall professional knowledge.



To fully understand what kinds of skills can be set in the T-shaped framework, it is necessary to see the types of competencies defined by modern researchers. For instance, Berezhna (2010) outlines the foundational types of competence required for the coaching profession [6]. These include:

1. Special competence: mastery of the professional activity at a high level and the ability to design one's own professional development.
2. Social competence: skills in collaborative/group work, cooperation, professional communication standards, and social responsibility for results.
3. Personal competence: skills in self-expression, self-development, and the ability to resist "professional deformation" (burnout).
4. Individual competence: skills in self-realization within the profession, readiness for professional growth/aging, and the ability to organize work rationally to avoid overload.

Bielyi and Hrashchenkova (2024) define communicative competency, which represents general culture of communication, including speech, listening, influence, and understanding others [7]. Kovalenko (2017) highlights the importance of psychological competency in sports and fitness coaching for effective training results [8]. Humennyi (2024) mentioned digital competence as a key element in the professional development of sports coaches [9]. A subset of digital competence, specifically the usage of VR (virtual reality) technologies in sports training, was covered by Hvozdet'ska et al. (2024) [10]. Kashuba et al. (2025) define logistical competence, which is associated with the ability to effectively plan, organize, and implement the training process during athlete preparation [11]. Yefremenko et al. (2024) research the health-preserving competency of sport coaches, which emphasizes the importance of rehabilitation to prevent injuries and illnesses during athlete training [12]. Research competency is described as a key element in the preparation of future sports coaches by Proskurin and Stadnichenko (2023), necessary to ensure the ability to arrange competitive selection of high-performance athletes [13]. This also includes



the need to be able to assess social factors, pedagogical and medical-biological indicators. Analytical skills are indicated as a critical tool to improve coaching efficiency, as indicated in research conducted by Fernandez-Echeverria et al. (2017) [14]. It is also important to note the importance of biomechanics and bio-medical knowledge, as stated by Waters et al. (2019) [15].

As we can see from various sources, skills and competencies are researched as isolated matters and lack proper systematization. There is no single framework that would cover all necessary competencies that must be acquired by a sports coach.

Isolation of previously unresolved parts of the general problem. While the term "T-shaped professional" exists and is researched in multiple disciplines, it is scarcely covered in the context of sports coaching. The majority of research articles mention separate types of skills and competencies without expanding on the depth of their acquisition. This means that there is no standard framework that would recommend the required skills and the depth of their acquisition for sports coaches. Determining a standardized T-shaped framework would help current and future sports coaches understand which skills must be developed in order to become a full-fledged professional in their niches.

Formulation of the objectives of the article (statement of the task). Considering the aforementioned issues, the purpose of the article is to suggest a unified T-shaped framework that would define the necessary competencies of the modern sports coach regardless of the kind of sports they work with. This requires conducting a series of expert interviews with experienced coaches ≥ 5 years of practical experience and the systematization of the authors' personal experience.

Presentation of the main material of the study. As there are various expertise models used across industries, it is necessary to briefly cover their types and "shapes" with their meanings. Based on the authors' experience and multiple online sources, it is possible to categorize the types of modern expertise models into five groups (table 1).



Table 1

Types of expertise models used across various industries

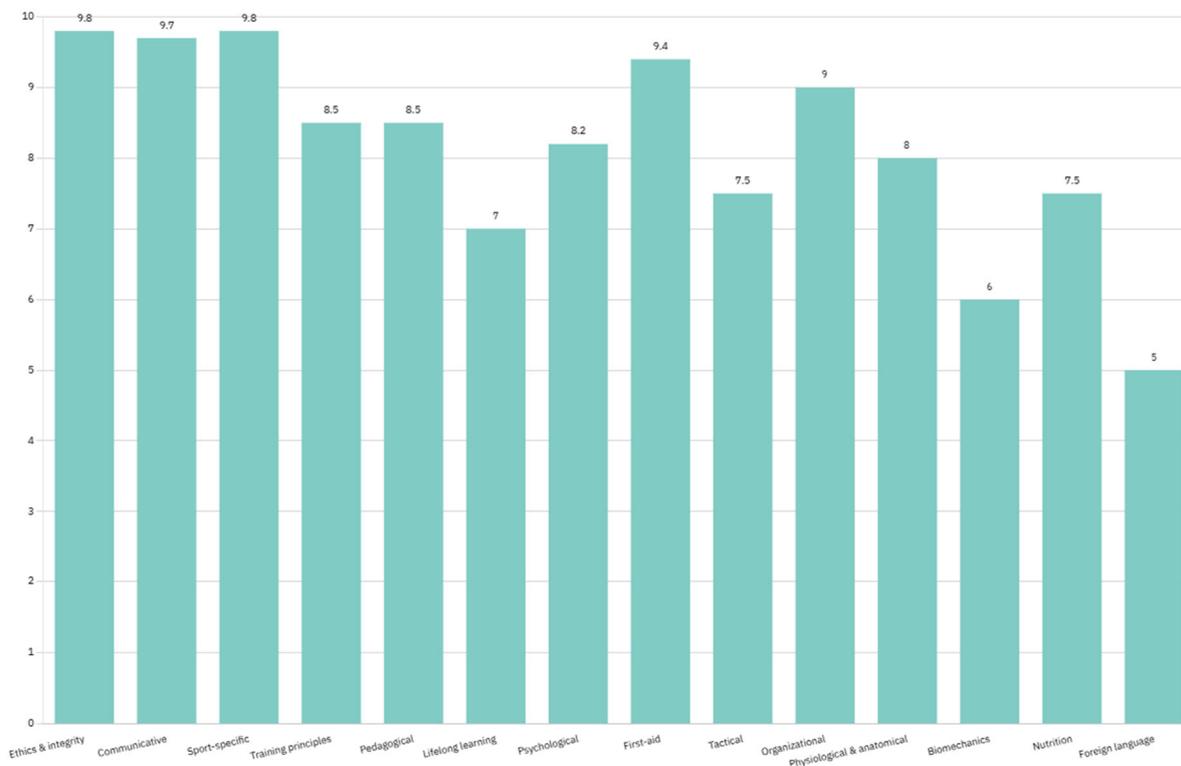
Model shape	Description
T-shaped	Deep vertical / broad horizontal. Possesses a core specialty with literacy in adjacent domains and soft skills.
I-shaped	Deep vertical / no horizontal. Characterized by extreme specialization and a lack of interest or ability in other fields.
Pi-shaped	Two vertical bars / broad horizontal. Deep mastery in two distinct disciplines (for example., physiotherapy and data science).
Comb-shaped	Multiple vertical bars / broad horizontal. A generalist with multiple "spikes" of expertise.
X-shaped	Depth, breadth, leadership/purpose. The integration of T-skills with strategic vision and executive presence.

Source: systematized by the author

The T-shaped model is chosen as the base standard due to its classic approach to knowledge acquisition. To choose which competencies to include in the model, we conducted 15 expert interviews with sports coaches possessing ≥ 5 years of practical experience in their domains. They were asked to indicate the importance of each proposed skill on a 1 to 10 rating scale. Additionally, the experts had the possibility to suggest their own skills and competencies to include in the data. This led to the following ratings (image 1).

Image 1

Average results of the expert interviews regarding the importance of select competencies in sports coach work



Source: systematized by the author

It is prominent that ethics and integrity, sports-specific knowledge, communicative, first-aid, and organizational competencies are considered to be the most important ones in a modern coach’s skillset as they received a 9+ rating on the scale. Some options like training principles, pedagogical, psychological, physiological & anatomical competencies received a rating between 8.0 and 8.9, indicating a certain importance, but not among the leading competencies. Other options like lifelong learning, tactical, biomechanical, and foreign language competencies received ratings between 5.0 and 7.9, indicating contextual relevance depending on the coach’s professional activities and current needs. For instance, the foreign language competency received high ratings from individual coaches who regularly participated in international events and utilized foreign materials in their work. However, those

coaches who primarily focused on local and national events did not have a need for foreign language, thus setting low ratings to this competency.

Based on this information, it is possible to structure the importance of each competency based on this rating (table 2).

Table 2

Competencies ranked by importance according to expert interviews

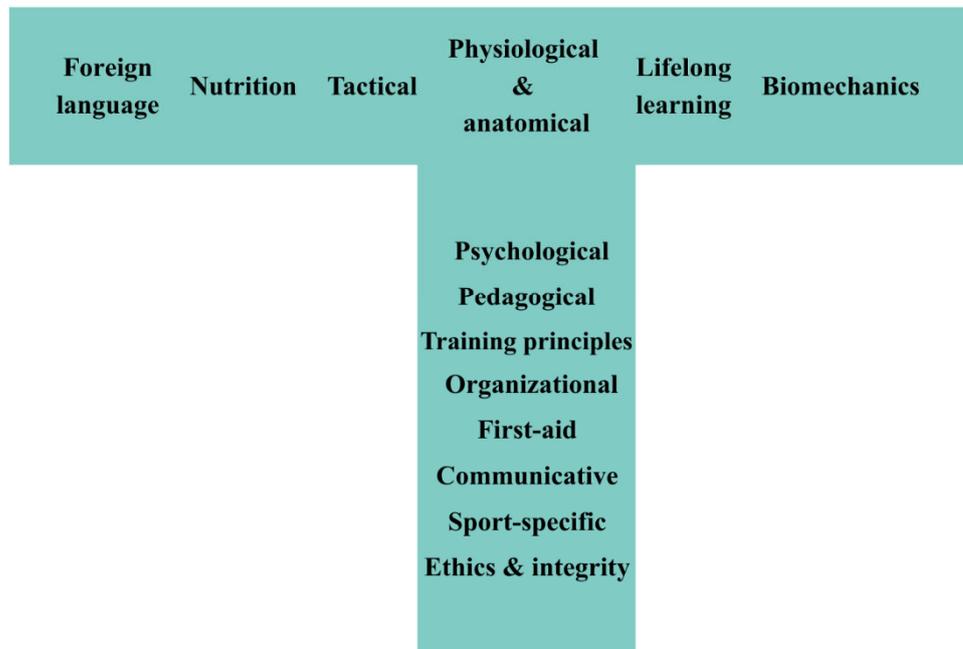
Ranking	Competency
1	Ethics & integrity competency
2	Sport-specific competency
3	Communicative competency
4	First-aid competency
5	Organizational competency
6	Training principles competency
7	Pedagogical competency
8	Psychological competency
9	Physiological & anatomical competency
10	Tactical competency
11	Nutrition competency
12	Lifelong learning competency
13	Biomechanics competency
14	Foreign language competency

Source: systematized by the author

Based on the acquired information, it is possible to create a basic T-shaped graph that would indicate the required depth of expertise in each mentioned competency (image 2).

Image 2

T-shaped sports coach competency framework based on depth on acquisition



Source: systematized by the author

It is necessary to note that the indicated skills are a certain baseline that is applicable to all kinds of sports without diving into their specifics. Each individual sport will have its own framework with certain skills, rules, and regulations. However, a generalized version provides ground for further improvement and development.

Conclusions. As the modern coach is no longer deemed as a "jack of all trades", the T-shaped professional model is introduced as a critical theoretical framework for unifying the disparate elements of sports coaching. By reconciling the vertical depth of technical expertise with the horizontal breadth of collaborative and interpersonal skills, this model offers a structured way to overcome disciplinary divides. Based on the analysis of expert interviews and theoretical research, it is clear that the T-shaped model is applicable and necessary for modern sports coaching. It successfully maps onto existing effectiveness frameworks by integrating professional, interpersonal, and intrapersonal knowledge. The proposed framework moves beyond isolated lists of skills to provide a systematized approach. This allows for the development of



standardized educational pathways where coaches can visualize the necessary balance between "hard" technical skills and "soft" interdisciplinary skills. While every sport retains unique technical regulations, the T-shaped competency framework provides a universal baseline. It equips coaches with the ability to maintain their expert identity while effectively collaborating within a multi-disciplinary support team, ensuring a full-fledged approach to athlete development. Further research requires developing T-shaped frameworks for specific kinds of sports.

References

1. Guest D. The hunt is on for the Renaissance Man of computing. *The Independent* (London). 1991. 17 Sept. URL: <https://wow.agiledata.io/wp-content/uploads/2022/10/David-Guest-1991-The-hunt-is-on-for-the-Renaissance-Man-of-computing.pdf> (accessed: 01.12.2025).
2. Hansen M. T. IDEO CEO Tim Brown: T-Shaped Stars: The Backbone of IDEO's Collaborative Culture. *Chief Executive*. 2010. 21 Jan. URL: https://chiefexecutive.net/ideo-ceo-tim-brown-t-shaped-stars-the-backbone-of-ideoes-collaborative-culture_trashed/ (accessed: 01.12.2025).
3. Taylor J., MacNamara Á., Sheridan D., Turkington J., Taylor R. Finding a path – understanding the employment, demands and preparation for high-performance rugby union coaching. *Sports Coaching Review*. 2025. P. 1–18. DOI: <https://doi.org/10.1080/21640629.2025.2560697>.
4. Côté J., Gilbert W. An Integrative Definition of Coaching Effectiveness and Expertise. *International Journal of Sports Science & Coaching*. 2009. Vol. 4. P. 307–323. DOI: <https://doi.org/10.1260/174795409789623892>.
5. Barile P., Barile S., Bassano C., Piciocchi P., Saviano M., Spohrer J. T-Shaped Professional (T-SP) *Model to support Human-Machine Interaction*. 2023. DOI: 10.54941/ahfe1003110.



6. Бережна Ж. В. Особливості професійної компетентності майбутнього тренера. *Педагогіка формування творчої особистості у вищій і загальноосвітній школі*. 2010. Вип. 6. С. 46–51.

7. Бєлий С. П., Гращенкова Ж. В. Комунікативна компетентність як професійна складова сучасного тренера з плавання. *Наукові інновації та передові технології*. 2024. № 10(38). С. 532–541. DOI: [https://doi.org/10.52058/2786-5274-2024-10\(38\)-532-541](https://doi.org/10.52058/2786-5274-2024-10(38)-532-541).

8. Коваленко В. О. Психологічна компетентність фітнес-тренера. *Наукові здобутки студентів Інституту людини*. 2017. № 1(7).

9. Гуменний О. Д. Digital competence as a key element in the professional training of youth sports school coaches-educators. *Перспективи та інновації науки (Серія «Педагогіка», Серія «Психологія», Серія «Медицина»)*. 2024. № 11(45). С. 273–285.

10. Гвоздецька С. В., Савченко В. В., Турчанінов Р., Ефективність використання віртуальної реальності в навчальних програмах із фізичної культури. *Академічні візії*. 2024. № 38.

11. Кашуба А. А., Ковальський В. В., Чалій Л. В. Логістична компетентність тренера як необхідна умова (складова) успішної професійної діяльності. *Науковий часопис Українського державного університету імені Михайла Драгоманова. Серія 15: Науково-педагогічні проблеми фізичної культури (фізична культура і спорт)*. 2025. Вип. 4 (190). С. 58–62.

12. Єфременко А., Крайник Я., Федорина Т., Петренко В., Фоменко В., Казак В. Актуальність здоров'язбережувальної компетентності майбутніх тренерів з виду спорту. *Освіта. Інноватика. Практика*. 2024. Т. 12, № 8. С. 20–26.

13. Проскурін А. В., Стадніченко В. С. Науково-дослідницька компетентність як основа готовності майбутнього тренера до здійснення спортивного відбору. *Науковий часопис Національного педагогічного*



університету імені М. П. Драгоманова. Серія 15: Науково-педагогічні проблеми фізичної культури (фізична культура і спорт). 2023. Вип. 1 (159). С. 118–121.

14. Fernandez-Echeverria C., Mesquita I., González-Silva J., Claver F., Moreno M. P. Match analysis within the coaching process: a critical tool to improve coach efficacy. *International Journal of Performance Analysis in Sport*. 2017. Vol. 17, no. 1–2. P. 149–163.

15. Waters A., Phillips E., Panchuk D., Dawson A. The coach–scientist relationship in high-performance sport: *Biomechanics and sprint coaches*. *International Journal of Sports Science & Coaching*. 2019. Vol. 14, no. 5. P. 617–628.