

IMPLEMENTATION AND PROSPECTS OF TEAM-BASED TRAINING IN MEDICAL EDUCATION IN UKRAINE AND EUROPE**Biduchak A.S.***Bukovinian State Medical University, Chernivtsi, Ukraine*

Key words: team-based learning, medical education, Ukraine, Europe, clinical reasoning, teamwork, interactive learning, educational innovation, interdisciplinary collaboration, professional training.

Bukovinian Medical Herald. 2025. V. 29, № 3 (115). P. 113-117.

DOI: 10.24061/2413-0737.29.3.115.2025.18

E-mail:*biduchak.anzhela@bsmu.edu.ua*

Abstract. The article explores the implementation of the innovative educational approach known as Team-Based Learning (TBL) within the context of modern medical education in Ukraine and European countries. TBL, which emphasizes active student engagement through structured teamwork, has proven effective in developing clinical reasoning, communication skills, and professional responsibility. This study examines the methodological foundations of TBL, its core components – including pre-class preparation, individual and team readiness assessment, collaborative case-solving, and instructor-led feedback – and highlights its pedagogical value in training future healthcare professionals. A comparative analysis of TBL integration in European Union countries (including the United Kingdom, the Netherlands, Germany, and Sweden) versus Ukraine is presented. While European medical universities have adopted TBL as a systematic and often hybridized approach (in combination with PBL, CBL, and simulation-based learning), Ukrainian institutions primarily implement TBL on a pilot basis or within international educational initiatives. Key barriers to TBL adoption in Ukraine include insufficient instructor training, lack of regulatory frameworks, limited institutional support, and scarce access to digital and infrastructural resources.

The article emphasizes the significant potential of TBL as a driver of educational reform in Ukraine's medical education system. The authors argue that the method can bring the learning process closer to real clinical practice, increase student motivation, and promote teamwork readiness in interdisciplinary healthcare settings. Strategic recommendations are offered for integrating TBL into national curricula, drawing on the experience and best practices of European medical schools.

ВПРОВАДЖЕННЯ ТА ПЕРСПЕКТИВИ ТІМ-БЕЙС НАВЧАННЯ У МЕДИЧНІЙ ОСВІТІ УКРАЇНИ ТА КРАЇН ЄВРОПИ**Бідучак А.С.**

Ключові слова: team-based learning, медична освіта, Україна, Європа, клінічне мислення, командна робота, інтерактивне навчання, освітні технології, міждисциплінарність, професійна підготовка.

Буковинський медичний вісник. 2025. Т. 29, № 3 (115). С. 113-117.

Анотація. У статті розглядається впровадження інноваційного освітнього підходу – team-based learning (TBL) – у контексті сучасної медичної освіти України та країн Європи. Методика TBL, заснована на активному залученні студентів у навчальний процес через командну взаємодію, демонструє високу ефективність у розвитку клінічного мислення, комунікативних навичок та професійної відповідальності. У межах дослідження проаналізовано методологічні основи TBL, його основні етапи та педагогічні принципи, зокрема: попередню самостійну підготовку, індивідуальне та командне тестування, роботу над клінічними кейсами та зворотний зв'язок із викладачем.

Здійснено порівняльний аналіз рівня інтеграції TBL у медичну освіту в країнах Європейського Союзу (зокрема, у Великій Британії, Нідерландах, Німеччині, Швеції) та в Україні. Показано, що в європейських університетах TBL використовується системно, часто в поєднанні з іншими активними методиками (PBL, CBL, симуляційне навчання), тоді як в Україні цей підхід здебільшого реалізується у форматі пілотних ініціатив. Визначено основні бар'єри для широкого впровадження TBL в Україні: відсутність методичної підтримки викладачів, нормативно-правових механізмів, ресурсного забезпечення та практичного досвіду. Автор акцентує увагу на потенціалі TBL як дієвого інструмента

Problems of higher medical education

модернізації української медичної освіти, що здатен сприяти наблизенню освітнього процесу до клінічної практики, підвищенню мотивації студентів та формуванню готовності до роботи в міждисциплінарних командах. Запропоновано шляхи інтеграції TBL у національну систему підготовки медичних кадрів на основі адаптації європейського досвіду.

Introduction. Medical education in the 21st century is undergoing rapid transformations due to global changes in the field of healthcare, increasing demands on the clinical competence of doctors and the need for interdisciplinary cooperation. Traditional approaches based on passive perception of knowledge – in particular, lectures and seminars – are increasingly giving way to active, student-centered forms of learning. These new methods are designed to form not only knowledge, but also practical skills, clinical thinking, ethical awareness and team interaction – all of which are critically important in the training of a modern specialist in the field of medicine. One of the most promising approaches that meets these requirements is TBL (Team-Based Learning) – training focused on working in small teams. This method was first proposed in the 1970s by Professor Larry Michaelsen in the USA for teaching in large academic groups. It has been actively introduced into medical education since the early 2000s, in particular at leading universities in North America, Europe and Asia. Today, TBL is used in the training of students of medical, pharmaceutical and nursing faculties, as well as in postgraduate studies.

A feature of TBL is that it combines independent study of educational material, individual and group assessment of what has been learned, as well as joint solving of realistic clinical situations. Such a structure creates conditions for the development of analytical thinking, responsibility for decision-making and the ability to defend a position with arguments – key elements of the competence of a future doctor. In addition, teamwork simulates real conditions of medical practice, where interaction between different specialists is critically important for patient safety.

The results of many studies confirm that TBL is effective not only in improving students' academic performance, but also in developing «soft skills» – communication, leadership, and collaboration. Compared to other active methods, in particular problem-based learning (PBL), TBL is more structured, which makes it suitable for widespread use within academic programs, including large groups.

Despite the positive reviews and the availability of an evidence base, the method requires further study, especially in the context of its long-term impact on students' professional development. More and more institutions of higher medical education are implementing TBL in their educational process, but questions arise regarding methodological support, adaptation to national standards, and training of teachers to act as facilitators rather than traditional lecturers.

In this regard, this article is devoted to analyzing the effectiveness of TBL in medical education. It is based on a review of current scientific publications, meta-analyses,

and results of the implementation of the methodology in different countries. Particular attention is paid to comparing TBL with other approaches, analyzing its advantages and challenges, and formulating practical recommendations for teachers and educational managers.

History. The Team-Based Learning methodology was developed in the 1970s by Professor Larry Michaelsen, an American educator who worked in the field of business education at the University of Minnesota. The main motivation for creating TBL was the desire to effectively teach large groups of students with a high level of involvement and responsibility, which was difficult to implement in the traditional lecture format.

The first steps in developing TBL were aimed at creating a structure that would encourage students not only to work on the educational material individually, but also to work closely in small teams to solve practical problems. During experimental classes, Michaelsen and his team noted a significant increase in the quality of material acquisition, as well as the development of students' communication and leadership skills.

In the 1980s and 1990s, the methodology gradually developed, acquiring specific forms and standardized elements: preparation for classes, individual and team tests, case-based learning. Since the early 2000s, TBL has been actively implemented in medical education, where teamwork and critical thinking are fundamental competencies.

TBL has been especially widespread in the United States of America, Canada, Great Britain and Western European countries, where its effectiveness has been confirmed by numerous studies. Over the past decade, interest in the implementation of TBL has been growing in Eastern European countries, in particular in Ukraine, which is associated with medical education reforms and integration into the European educational space.

Today, Team-Based Learning is one of the leading active learning methods that meets the modern requirements for the development of competencies of future medical professionals. Its implementation contributes not only to improving academic results, but also to the formation of important «soft skills» such as communication, team interaction, and critical thinking.

The purpose of the study is to analyze the effectiveness of the implementation of team-based learning in the higher medical education systems of Europe and Ukraine, in order to identify its impact on the quality of training of medical specialists, as well as to assess the possibilities of adapting the methodology to the domestic educational environment.

Materials and methods of the study. The study used a comprehensive approach that combines a systematic analysis of scientific publications, a review of practices for

implementing TBL in higher medical education institutions in the countries of the European Union and Ukraine, as well as an analytical comparison of the results taking into account the context of each educational system. The following methods were used in the study: content analysis – for a qualitative analysis of descriptions of TBL classes, implementation models, pedagogical results; comparative analysis – comparison of data between the countries of the European Union and Ukraine on the effectiveness of the use of TBL in medical education; descriptive statistics – analysis of average results of students' academic performance, level of satisfaction with learning, assessment of teamwork (based on data from primary studies presented in articles); expert evaluation method – analysis of responses from teachers and students, presented in the form of questionnaires or interviews.

Results. Team-Based Learning is a structured, interactive approach to learning that is based on students working in small, permanent teams to actively learn, develop critical thinking, decision-making, and collaboration skills.

The methodology includes several key stages:

1. Pre-study – students work through the learning material independently (articles, lectures, videos).
2. Individual Readiness Assessment (iRAT) – a short test to check understanding of the basic material.
3. Team Readiness Assessment (tRAT) – discussion of the same issues in a small group, which stimulates collective thinking and reasoning.
4. Application of knowledge in a practical context – students solve clinical scenarios, cases, or problem situations.

5. Feedback and discussion – the teacher summarizes, focusing on correct clinical thinking.

The main principles of TBL:

- permanent teams: students work in the same groups throughout the course (usually 5-7 people);
- preparation for the lesson: before the lesson, students study the materials independently (videos, texts, instructions);
- readiness assessment: the lesson begins with a short test (iRAT), then the same test is performed collectively (tRAT);
- case-based learning: groups analyze clinical or practical tasks, make a decision, justify it;
- competition and cooperation: teams can compare answers, argue their positions, compete for the best result;
- active feedback: the teacher moderates the discussion, explains difficult points and stimulates critical thinking.

Difference from other methods:

Compared to PBL (Problem-Based Learning), TBL is more structured and more easily scalable to large groups.

TBL differs from traditional lectures in its high level of interaction and student activity in the lesson.

TBL combines individual responsibility and group effectiveness, creating a balance between personal contribution and collective work.

Advantages of TBL in medical education:

- active learning: students do not just passively listen to lectures, but work with real clinical tasks;

- development of teamwork and communication: critically important skills for doctors;

- deeper assimilation of knowledge: learning through application in conditions as close as possible to clinical practice.

- formation of clinical thinking: students learn to make decisions, assess risks and work in a team.

In leading European medical universities, TBL is often integrated into courses in internal medicine, pediatrics, surgery and pharmacology. Studies show that student satisfaction and learning efficiency increase by 20–30% compared to traditional teaching methods.

Comparative analysis of TBL implementation in Ukraine and European countries. In European countries, the implementation of team-based learning (TBL) is taking place as part of a general transition to a student-centered education model. Universities in the UK, the Netherlands, Sweden, Germany, and other EU countries are actively applying this approach in bachelor's and master's medical programs. In particular, TBL is used within the framework of integrated courses, interdisciplinary blocks, simulation training, and assessment of clinical training.

EU countries are characterized by: systematic support for teachers (training, certification courses on TBL methodology); development of standardized cases and scenarios, integration of TBL into formal educational standards, support for digital platforms for organizing teamwork.

In contrast, in Ukraine, the application of TBL is currently limited mainly to the initiatives of individual teachers, departments, or within international projects. Examples of implementation can be found in the following institutions: O.O. Bogomolets National Medical University; Lviv National Medical University. Danylo Halytskyi; Uzhhorod National University (pilot TBL sessions within the framework of Erasmus+ projects) and Bukovina State Medical University.

The main challenges for implementation in Ukraine are:

- insufficient methodological training of teachers;
- lack of regulatory support within the framework of state educational standards;
- overload of programs with theoretical disciplines;
- limited material and technical base (lack of flexible learning spaces, digital platforms for teamwork).

Despite this, positive dynamics are observed due to the active participation of Ukrainian higher education institutions in international grant initiatives, as well as the growing interest among students in practice-oriented and interactive learning.

Prospects for the development of TBL in medical education in Ukraine. In the context of the transformation of higher education and increasing requirements for the quality of training of future medical specialists, the implementation of team-based learning in Ukraine is not only an expedient but also a necessary step. This approach has the potential to become an effective tool for improving practical competence, developing clinical thinking and forming team interaction – skills that are critically important in modern medicine.

Problems of higher medical education

Expected directions for the development of TBL in Ukrainian medical education:

1. Institutionalization of the method: inclusion of TBL in official educational programs, standards and curricula.

2. Development of teaching potential: systematic training of teachers in the principles of TBL, exchange of experience, participation in international educational projects.

3. Digitalization and technical support: creation of online platforms for TBL sessions, use of gamified solutions, electronic resources and mobile applications.

4. Scientific justification of effectiveness: research into the impact of TBL on learning outcomes, student motivation and the quality of clinical training.

5. International integration: deepening cooperation with European universities, participation in joint research and increasing the mobility of students and teachers.

Given the positive European experience, TBL can become a catalyst for changes in approaches to teaching medicine in Ukraine. By providing appropriate support at the level of policies, infrastructure and pedagogical culture, it is possible to create a sustainable model of high-quality and practice-oriented medical education.

Conclusions. Team-Based Learning is not just an innovative pedagogical approach, but a strategy that transforms the traditional model of medical education into a more flexible, dynamic and practical skills-oriented one. The successful experience of European countries demonstrates that TBL contributes to the formation of clinically thinking, communicative and team-oriented medical specialists who are ready to work in the conditions of the modern healthcare system.

It is especially relevant for Ukraine. Given the need to modernize higher medical education, the implementation of TBL can become a catalyst for deeper structural changes: from the transition from passive knowledge acquisition to active learning; from an individualistic model to cooperation and team solving of clinical tasks; from theoretical training to a practically oriented, interdisciplinary approach.

The significant advantages of TBL are the development of critical thinking, communication skills, professional ethics, responsibility for joint decisions – all those qualities that form the basis of the professional competence of a modern doctor. It is especially important that TBL allows to reduce the gap between academic knowledge and the realities of clinical practice.

However, for the full implementation of TBL in Ukrainian medical universities, a holistic strategy is needed, which will include updating educational standards, training of teachers, development of digital infrastructure and creation of educational and methodological materials. It is no less important to form a new educational culture among students and teachers, which involves active participation, mutual respect, team dynamics, and constant professional growth.

Therefore, TBL is not only an educational technology, but an important element of the future of medical education in Ukraine. Its implementation can be a key step towards creating a system that not only meets European standards, but also trains a new generation of doctors – mobile, empathetic, professionally mature and ready for the challenges of the 21st century.

Список літератури

1. Arjanto P, Raya Aditama MH. Integrating problem-based and team-based learning: A hybrid approach for advancing medical education pedagogy. *J Taibah Univ Med Sci*. 2025;20(1):107-8. DOI: 10.1016/j.jtumed.2025.02.002
2. Balaji A, Shoraf P, Sanjana L, Mahendran C, Thirumagal R, Sakthipriyan S. Implementation of team based learning for MBBS students – An innovative teaching learning method in medical education. *Journal of Education Technology in Health Sciences*. 2024;11(1):28-33. DOI: 10.18231/j.jeths.2024.006
3. Joshi T, Budhathoki P, Adhikari A, Poudel A, Raut S, Shrestha DB. Team-Based Learning Among Health Care Professionals: A Systematic Review. *Cureus*. 2022;14(1):e21252. DOI: 10.7759/cureus.21252
4. Міністерство охорони здоров'я України. Стратегія розвитку медичної освіти в Україні. Київ: МОЗ України; 2020. 40 с.
5. Monnet J. Medical education in the European Union: challenges for Ukraine [Internet]. National Erasmus+ Office in Ukraine; 2021[cited 2025 Aug 05]. Available from: <https://erasmusplus.org.ua/en/projects/medical-education-in-the-european-union-challenges-for-ukraine/>
6. Ishizuka K, Shikino K, Takada N, Sakai Y, Ototake Y, Kobayashi T, et al. Enhancing clinical reasoning skills in medical students through team-based learning: a mixed-methods study. *BMC Med Educ*. 2025;25(1):221. DOI: 10.1186/s12909-025-06784-w
7. Budko H, Ivakhniuk T, Ivakhniuk Y, Plakhtiienko I, Tsekhmister Y. Digital education hubs in medical higher education: Ukraine and the EU perspectives. *Amazonia Investiga*. 2023;12(63):233-42. DOI: 10.34069/AI/2023.63.03.22
8. Соколова І. Медична освіта України: світові тенденції, європейські орієнтири і національні пріоритети. *Неперервна професійна освіта: теорія і практика*. 2019;2(2):7-15. DOI: 10.28925/1609-8595.2019.2.715
9. Рожнова ТЄ, Вадзюк СН, Наконечна СС, Ратинська ОМ. Інтерактивні методи навчання – шлях до підвищення ефективності освітнього процесу у медичних закладах вищої освіти. *Медична освіта*. 2022;3:51-9. DOI: 10.11603/m.2414-5998.2022.3.13408
10. Башкірова ЛМ, Ловас ПС, Якименко ВВ. Європейські стратегії розвитку медичної освіти: досвід для України. *Академічні візії*. 2023;20:1-10. DOI: 10.5281/zenodo.8068250
11. Грищенко О, Копчак О. Аналіз переваг та недоліків застосування інтерактивних методів навчання у підготовці майбутніх лікарів. *Український педагогічний журнал*. 2023;1:128-32. DOI: 10.32405/2411-1317-2023-1-128-132
12. Бондар Т, Каліна К, Шейко А. Формування навичок командотворення засобами інтерактивних освітніх технологій у здобувачів вищої медичної освіти як духовно-інтелектуальна складова освітнього процесу. *Актуальні питання гуманітарних наук*. 2023;1(69):256-63. DOI: 10.24919/2308-4863/69-1-37

References

1. Arjanto P, Raya Aditama MH. Integrating problem-based and team-based learning: A hybrid approach for advancing medical

- education pedagogy. J Taibah Univ Med Sci. 2025;20(1):107-8. DOI: 10.1016/j.jtumed.2025.02.002
2. Balaji A, Shoraf P, Sanjana L, Mahendran C, Thirumagal R, Sakthipriyan S. Implementation of team based learning for MBBS students – An innovative teaching learning method in medical education. Journal of Education Technology in Health Sciences. 2024;11(1):28-33. DOI: 10.18231/j.jeths.2024.006
3. Joshi T, Budhathoki P, Adhikari A, Poudel A, Raut S, Shrestha DB. Team-Based Learning Among Health Care Professionals: A Systematic Review. Cureus. 2022;14(1):e21252. DOI: 10.7759/cureus.21252
4. Ministerstvo okhorony zdorov'ia Ukrainy. Stratehiia rozvytku medychnoi osvity v Ukraini [Ministry of Health of Ukraine. Strategy for the Development of Medical Education in Ukraine]. Kyiv: Ministry of Health of Ukraine; 2020. 40 p. 20. (in Ukrainian).
5. Monnet J. Medical education in the European Union: challenges for Ukraine [Internet]. National Erasmus+ Office in Ukraine; 2021[cited 2025 Aug 05]. Available from: <https://erasmusplus.org.ua/en/projects/medical-education-in-the-european-union-challenges-for-ukraine/>
6. Ishizuka K, Shikino K, Takada N, Sakai Y, Ootake Y, Kobayashi T, et al. Enhancing clinical reasoning skills in medical students through team-based learning: a mixed-methods study. BMC Med Educ. 2025;25(1):221. DOI: 10.1186/s12909-025-06784-w
7. Budko H, Ivakhniuk T, Ivakhniuk Y, Plakhtienko I, Tsekhmister Y. Digital education hubs in medical higher education: Ukraine and the EU perspectives. Amazonia Investiga. 2023;12(63):233-42. DOI: 10.34069/AI/2023.63.03.22
8. Sokolova I. Medychna osvita Ukrainy: svitovi tendentsii, yevropeis'ki oriientyry i natsional'ni priorytety [Medical education in Ukraine: global trends, European guidelines and national priorities]. Neperervna profesiina osvita: teoriia i praktyka. 2019;2(2):7-15. DOI: 10.28925/1609-8595.2019.2.715 (in Ukrainian).
9. Rozhnova TI, Vadziuk SN, Nakonechna SS, Ratynska OM. Interaktyvni metody navchannia – shliakh do pidvyschennia efektyvnosti osvith'oho protsesu u medychnykh zakladakh vyschoi osvity [Interactive teaching methods are a way to increase the efficiency of the educational process in medical institutions of higher education]. Medychna osvita. 2022;3:51-9. DOI: 10.11603/m.2414-5998.2022.3.13408 (in Ukrainian).
10. Bashkirova LM, Lovas PS, Yakymenko VV. Yevropeis'ki stratehii rozvytku medychnoi osvity: dosvid dlia Ukrainy [European strategies for the development of medical education: experience for Ukraine]. Akademichni vizii. 2023;20:1-10. DOI: 10.5281/zenodo.8068250 (in Ukrainian).
11. Hrytsenko O, Kopchak O. Analiz perevah ta nedolikh zastosuvannia interaktyvnykh metodiv navchannia u pidhotovtsi maibutnikh likariv [Analysis of the advantages and disadvantages of using interactive teaching methods in the training of future doctors]. Ukrains'kyi pedahohichnyi zhurnal. 2023;1:128-32. DOI: 10.32405/2411-1317-2023-1-128-132 (in Ukrainian).
12. Bondar T, Kalina K, Sheiko A. Formuvannia navychok komandotvorennia zasobamy interaktyvnykh osvithnikh tekhnolohii u zdobuvachiv vyschoi medychnoi osvity yak dukhovno-intelektual'na skladova osvith'oho protsesu [Formation of team-building skills through interactive educational technologies among students of higher medical education as a spiritual and intellectual component of the educational process]. Aktual'ni pytannia humanitarnykh nauk. 2023;1(69):256-63. DOI: 10.24919/2308-4863/69-1-37 (in Ukrainian).

Відомості про авторів

Бідучак А.С. – д-р мед. наук, доцент кафедри соціальної медицини та організації охорони здоров'я, Буковинський державний медичний університет, м. Чернівці, Україна. ORCID ID: <https://orcid.org/0000-0003-3475-1497>.

Information about the author

Biduchak A.S. – MD, PhD, Associate Professor at the Department of Social Medicine and Public Health, Bukovinian State Medical University, Chernivtsi, Ukraine.

Дата першого надходження рукопису до видання: 22.08.2025.

Дата прийнятого до друку рукопису після рецензування: 05.08.2025.

Дата публікації: 30.09.2025.

© Бідучак А.С., 2025