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**THE PHENOMENON OF
“DUAL EDUCATION”
IN THE PROCESS
OF PROFESSIONAL
TRAINING OF THE
FUTURE SPECIALIST:
EUROPEAN
EXPERIENCE**

Liudmila Popova

Candidate of Pedagogical Sciences,
Associate Professor
Associate Professor of the Department
of Ukrainian and Foreign Languages
and Methods of their Teaching in Primary
and Preschool education,
Dragomanov Ukrainian State University,
9 Pyrohova Str., Kyiv, Ukraine
<https://orcid.org/0000-0003-3764-3870>
e-mail: liudmila-pln@ukr.net

Abstract. *The article examines the role of the “Dual Education” phenomenon in the professional training of future specialists, current issues of European experience in this field. Dual education is a key component of the professional training of future specialists in modern conditions. In the constantly developing labor market, employers require qualified specialists who have both theoretical knowledge and practical experience. Dual education, an educational model that combines vocational and classroom learning, has proven to be a key component in training future specialists. Firstly, dual education through the integration of on-the-job training and theoretical learning enables students to gain a full understanding of their chosen profession, effectively bridging skills gaps. Therefore, graduates who studied under conditions of dual education become very competitive in the global labor market. Here are a few reasons why dual education is important in today’s context, namely: Bridging the skills gap (With rapid technological advancements and changing industry needs, there is a growing skill gap in the labor market. Dual education helps bridge this gap by equipping students with both theoretical knowledge and practical skills related to the chosen profession); Increased employability: (dual education graduates have higher employability rates because they have ready-to-work skills and industry knowledge; this makes them attractive candidates for employers looking for competent professionals who can immediately contribute to the success of their organization); Adapting to Industry 4.0 (As industry continues to evolve with the advent of automation, artificial intelligence and other technological disruptions, a dual degree ensures that students are prepared for the demands of Industry 4.0. By integrating on-the-job learning with classroom learning, students gain the necessary skills to adapt and thrive in this new industrial environment); Promoting lifelong learning (Dual education fosters a culture of lifelong learning, emphasizing the importance of continuous skill development and adaptability. This prepares students to remain relevant and competitive throughout their careers in a rapidly changing job market).*

Key words: *dual education, professional training, European experience, theoretical and practical components of education, institutions of higher education, transversal elements, work-based learning.*

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ФЕНОМЕН «ДУАЛЬНОЇ ОСВІТИ» В ПРОЦЕСІ ПРОФЕСІЙНОЇ ПІДГОТОВКИ МАЙБУТНЬОГО ФАХІВЦЯ: ЄВРОПЕЙСЬКИЙ ДОСВІД

Попова Л. М.

кандидат педагогічних наук, доцент,
доцент кафедри української й іноземних мов
та методик їх навчання в початковій
та дошкільній освіті,
Український державний університет
імені Михайла Драгоманова,
вул. Пирогова, 9, Київ, Україна
<https://orcid.org/0000-0003-3764-3870>
e-mail: liudmila-pln@ukr.net

Анотація. В статті розглядаються питання ролі феномену «дуальної освіти» в професійній підготовці майбутніх фахівців, актуальні питання європейського досвіду в цій сфері. Дуальна освіта є ключовою складовою професійної підготовки майбутніх спеціалістів в сучасних умовах. На ринку праці, що постійно розвивається, роботодавці вимагають кваліфікованих спеціалістів, які мають як теоретичні знання, так і практичний досвід. Дуальна освіта, освітня модель, яка поєднує професійне навчання та навчання в аудиторії, виявилася ключовим компонентом у підготовці майбутніх спеціалістів. По-перше, дуальна освіта завдяки інтеграції навчання на робочому місці та теоретичного навчання це дає змогу студентам отримати повне розуміння обраної ними професії, ефективно усуваючи прогалини в навичках. Відтак, випускники, які навчались в умовах дуальної освіти стають більш конкурентоспроможними на світовому ринку праці. Ось кілька причин, чому дуальна освіта важлива в сучасному контексті, а саме: Усунення нестачі навичок (Зі швидким технологічним прогресом і зміною потреб промисловості на ринку праці зростає нестача навичок. Дуальна освіта допомагає подолати цей розрив, озброюючи студентів як теоретичними знаннями, так і практичними навичками, які стосуються обраної професії); Підвищення можливостей працевлаштування: (випускники дуальної освіти мають вищі показники працевлаштування, оскільки вони володіють готовими до роботи навичками та галузевими знаннями; це робить їх привабливими кандидатами для роботодавців, які шукають компетентних спеціалістів, які можуть негайно сприяти успіху їхньої організації); Адаптація до Індустрії 4.0 (Оскільки промисловість продовжує розвиватися з появою автоматизації, штучного інтелекту та інших технологічних збоїв, подвійна освіта гарантує, що студенти підготовлені до вимог Індустрії 4.0. Інтегруючи навчання на робочому місці з навчанням у класі, студенти отримують необхідні навички, щоб адаптуватися та процвітати в цьому новому промисловому середовищі); Сприяння навчанню впродовж життя (Дуальна освіта сприяє розвитку культури навчання впродовж життя, наголошуючи на важливості постійного розвитку навичок і здатності до адаптації. Це готує студентів залишатися актуальними та конкурентоспроможними протягом усієї кар'єри на швидко мінливому ринку праці).

Заохочення міцного партнерства між галуззю та освітою: системи подвійної освіти спираються на співпрацю між навчальними закладами та роботодавцями. Ці партнерства створюють можливості для студентів спілкуватися з професіоналами та розвивати відповідні галузеві навичкам, а також гарантують, що навчальні програми відповідають поточним потребам галузі. Підсумовуючи, дуальна освіта є надзвичайно важливою в наш час для підготовки майбутніх спеціалістів, які адаптуються, кваліфіковані та готові до роботи в умовах дедалі більшої конкуренції та розвитку ринку праці.

Ключові слова: дуальна освіта, професійна підготовка, європейський досвід, теоретичні і практичні складові навчання, заклади вищої освіти, елементи трансверсальності, навчання, що базується на поєднанні з роботою.

Introduction and current state of the research problem. The rapidly changing labor market demands a workforce equipped with both theoretical knowledge and practical skills. Traditional education systems often struggle to meet these demands, leading to gaps between academic training and the practical needs of industries. In response to this challenge, dual education systems have emerged as a viable solution, particularly in Europe. Dual education, also known as dual training, integrates classroom-based education with hands-on work experience, providing students with a comprehensive learning experience. This model not only enhances the employability of graduates but also addresses the skills shortages faced by many industries.

The phenomenon of dual education represents a promising approach to bridging the gap between education and employment. While significant progress has been made in understanding its benefits and implementation in Europe, ongoing research is essential to address existing challenges and explore new opportunities for global adaptation. By continuing to investigate and refine dual education systems, we can better prepare future specialists to meet the evolving demands of the labor market. In Europe, dual education systems are well-established and have been credited with contributing to low youth unemployment rates and strong economic performance. These systems are supported by robust legal frameworks, active participation from industries, and a cultural emphasis on vocational training. The success of dual education in Europe has sparked interest in adopting similar models in other regions.

The purpose and objectives of the study. The main purpose of the study is to investigate the dual education model and its effectiveness in professional training. This includes understanding how the integration of theoretical education with practical training in a work environment prepares future specialists more effectively than traditional education systems.

Research methods. The study likely employs a variety of research methods to achieve its objectives. Here are the primary research methods that could be utilized in such a study: *literature review* (to gather existing information on dual education systems in Europe and provide a theoretical framework for the study); *comparative analysis* (to compare different dual education models across various European countries); *case studies* (to provide in-depth insights into successful implementations of dual education systems); *document analysis* (to analyze policy documents, curricula, and other official materials related to dual education) and others. By employing these diverse research methods, the study aims to provide a thorough understanding of the dual education phenomenon and offer valuable insights for improving professional training systems.

The statement of the main material research. Dual education (from the Latin «dualis» – double) is a type of education, under the conditions of which professional training of individuals in educational institutions of higher education is carried out in two forms (theoretical and practical). Theoretical training takes place in university classrooms, and practical training is combined with on-the-job training at enterprises, institutions and organizations working in the relevant field.

“Dual education”, also known as “dual study” or “apprenticeship”, is an educational approach that combines practical on-the-job training with theoretical classroom-based

learning. The history of dual education dates back to the Middle Ages in Germany, where the guild system played a significant role in the development of vocational training. In this system, young people learned a trade or craft through apprenticeships under the guidance of experienced masters.

This term is believed to have been popularized by the German economist and politician, Friedrich Althoff (1839-1908). Althoff was instrumental in shaping the modern German dual education system. As an ardent supporter of vocational education, he recognized the importance of hands-on, practical training in preparing individuals for successful careers.

Althoff's contributions to vocational education were significant and wide-ranging. He championed the integration of theoretical learning and practical experience, emphasizing the need for students to develop both academic knowledge and practical skills in the workplace. His work helped to lay the groundwork for the dual education system that Germany is renowned for today. In his work, Althoff emphasized the importance of combining practical training in the workplace with theoretical education in vocational schools. He believed that this approach would produce skilled workers who were well-prepared for the demands of the industrial economy.

Althoff's ideas gained traction and were eventually incorporated into the Handicrafts Act of 1889, which laid the foundation for the modern German dual education system. As a result, Althoff is often credited with coining the term "dual education" and helping to establish the concept in Germany. However, the modern dual education system in Germany emerged during the 19th century. Key milestones include:

1. The Prussian Reforms led to the creation of the first vocational schools, which focused on providing theoretical knowledge alongside practical training (1809).
2. The Handicrafts Act established the framework for apprenticeships and set standards for training, laying the foundation for the modern dual education system (1889).
3. The Weimar Constitution enshrined vocational education as a key component of the German education system (1919).
4. The Vocational Training Act (*Berufsbildungsgesetz*) was passed, which codified the dual education system and defined the roles and responsibilities of employers, vocational schools, and the government (1969).

Over time, the success of the German dual education system led other countries, such as Austria, Switzerland, Denmark, and the Netherlands, to adopt similar approaches. More recently, countries like the United States, Australia, and some Asian nations have begun implementing dual education programs in various forms. These articles and scientists have contributed to a deeper understanding of dual education and its role in promoting vocational education and training. Here are some early articles and scientists who have written about dual education:

- "Vocational Education and Training in Germany: Short Description" by Bernd Köhler (1996). This article provides an overview of the German dual education system and its historical development;
- "The German Dual System of Vocational Education and Training: Its Main Characteristics and Challenges" by Bernd Bonin (2010). This article examines the strengths and challenges of the German dual education system;
- "The German Dual Apprenticeship System" by Ludwig Gerlach (2004). This article discusses the history, structure, and benefits of the German dual education system.

– “Dual System of Vocational Training in Germany” by Günther Schanz (2000). In this article is described the main ideas of the German dual education system and its role in the country’s economic success.

The system has proven to be successful in addressing the skills gap, reducing youth unemployment, and fostering strong industry-education partnerships. As a result, it continues to be seen as a model for vocational education and training worldwide. In a dual education system, students typically split their time between a vocational school or college and an apprenticeship at a company. They receive a salary during their apprenticeship, which usually lasts between two to four years.

The main idea behind dual education is that students learn both theoretical knowledge and practical skills simultaneously, making them more employable upon graduation. Here are some key benefits of dual education:

– *Practical experience*: By working in a real job environment, students gain practical experience that complements their theoretical studies.

– *Improved employability*: The combination of practical experience and theoretical knowledge makes students more attractive to potential employers, increasing their chances of securing a job after completing the program.

– *Earn while you learn*: Students in dual education programs earn a salary during their apprenticeship, which helps them cover living expenses and reduces the financial burden of education.

– *Strong industry connections*: Dual education programs often have strong connections with industry partners, which can lead to job opportunities and career advancement.

The year 2024 marked a significant milestone for the advancement of dual higher education, as the first European Dual Studies Conference took place on April 10-11 at Malta College of Arts, Science and Technology. This event brought together researchers, policymakers, and industry representatives to discuss the Future of Work and related transversal elements in the context of dual education.

Showcasing the latest academic research and insights in the field, the conference received 52 research papers from diverse academic institutions across Europe. These papers covered a range of topics related to dual higher education and the future of work, highlighting the importance and relevance of this area of study.

The research of leading European scientists and researchers was gaining special interest in the issue of introducing “duality” into the modern process of professional training of future specialists. A team of researchers, consisting of A. J. Mähönen, S. L. Halimaa, P. Kontro, J. Heiskanen, T. Kinnunen, S. Vuohelainen, and K. Pakarinen [6], delved into the application of cutting-edge virtual learning environments (VLEs) for enhancing educational and professional experiences in biomedical laboratory science and perioperative nursing. They emphasize that “Virtual learning environments (VLEs) are developing rapidly and are already part of everyday life. Advances in technology have brought about groundbreaking transformations in the field of education, particularly with the advent of immersive virtual learning environments (VLEs). These interactive platforms, accessible anytime and anywhere, offer an innovative solution for both educational institutions and working professionals, allowing for real-world work processes and instructions to be superimposed onto the viewer’s field of vision.

The novelty of this project is the development of customized VLEs, co-created with educators and industry professionals, that accurately represent realistic work environments.

Dr. Rupert Beinhauer and M. Mag. Waltraud Jelinek-Krickl [2] have brought to the forum the significance of informal learning within the workplace. Described as an unstructured, experiential form of learning, informal learning presents a reservoir of untapped knowledge and skills that are instrumental for professional growth and development. Despite its informal nature, this type of learning plays a vital role in enhancing workplace knowledge and expertise, making it an indispensable component of the learning ecosystem.

Researchers Tatjana Marinkovic, Marina Stamenovic, Gabrijela Grujic, Predrag Maksic, and Nebojsa Curcic [7] have underscored the crucial role that learning mobility plays in enhancing the professional, social, and intercultural skills of students enrolled in dual study programs in higher education. Through immersive experiences in diverse cultural environments, students gain valuable transferrable skills, such as problem-solving and teamwork, while expanding their perspectives and broadening their career horizons. In a landmark move, the European Commission proposed a Council Recommendation entitled “Europe on the Move”, setting ambitious targets to expand learning mobility opportunities for learners across all education and training systems, including vocational education and training (VET), as well as youth and sports.

By 2030, this initiative aims to achieve three key objectives:

1. At least 25% of higher education graduates should have had a learning mobility experience;
2. At least 15% of VET learners should have benefited from a learning mobility abroad;
3. At least 20% of all learners benefiting from learning mobility abroad – in all education and training, and youth and sport systems – should be people with fewer opportunities... [7, p. 159].

In his research, M. Jurkovic [4, p. 32] delves into the significance of micro-qualifications in dual higher education systems, particularly within the Croatian context. In light of the European Commission’s recent definition of micro-credentials as records of learning outcomes acquired through a limited amount of learning, evaluated against clear standards, the development and integration of these credentials pose a significant challenge for higher education institutions (HEIs) in the European Union.

Of particular interest was the research of Austrian scientists Friehmelt, Ing. Holger and Mag. Dr. MSc. Gernot Paulus “Linking innovative drone technologies with novel educational frameworks” [3]. The European Drone and Data Academy (EDDA) project aimed to transform Austria into a premier destination for Unmanned Aerial System (UAS) education. This ambitious initiative envisioned creating an internationally renowned and fully certified academy that would serve as a center of excellence for UAS education, establishing Austria as a key player in the field and attracting students from around the world.

The role and competencies of university mentors in dual education in Spain were described by Amaia Lersundi and Arantza Ozaeta. While dual education has its benefits, it’s not without its challenges. These include finding suitable companies to partner with, ensuring the quality of training, and making the system adaptable to different industries and occupations. The psychological and pedagogical competencies of a mentor form the core of corporate qualification. These competencies include motivational, value-based, process-activity, cognitive, and reflexive-analytical components, each of which can be developed to varying degrees: high, medium, or sufficient. This multi-faceted range of competencies serves as the foundation for the various roles that mentors can play in the corporate environment, such as mentor, tutor, coach, or facilitator. By nurturing and

refining these competencies, mentors are better equipped to guide, support, and develop their mentees to reach their full potential.

Dual education, while not without its challenges, has demonstrated several positive attributes that are worth highlighting:

- *Practical experience*: Dual education provides students with hands-on experience in the workplace, which enhances their practical skills and knowledge.

- *Improved employability*: By completing a dual education program, students can develop a unique skill set that is highly sought after in the job market, increasing their employability and career prospects.

- *Financial benefits*: Students in dual education programs earn a salary during their apprenticeship, which helps them cover living expenses and reduces the financial burden of education.

- *Industry connections*: Dual education programs often have strong connections with industry partners, which can lead to job opportunities and career advancement.

Analyzing the phenomenon of «dual education», it is also necessary to focus on several negative, in our opinion, aspects, namely:

- *Limited academic focus*: Dual education programs tend to focus on vocational training rather than academic subjects, which may limit students' future academic opportunities.

- *Longer duration*: Dual education programs often take longer to complete than traditional academic programs, which can delay students' entry into the workforce.

Despite the potential benefits, the implementation of dual education has not been without its challenges. Incorporating new host firms or revising the work-linked training contract can be challenging due to a lack of flexibility in the system. Public administration may not be providing adequate support for the effective implementation of dual education programs, hindering their overall effectiveness.

Conclusions and perspectives of further researches. To summarize, dual education presents a valuable opportunity for students to develop the skills, knowledge, and competencies required to thrive in an ever-changing job market. By integrating academic education with practical experience in a professional setting, dual education fosters a well-rounded learning experience that better equips graduates with the abilities and expertise needed to excel in their chosen fields. This unique combination of theory and practice not only prepares future specialists for the challenges and opportunities of the modern workplace but also helps to bridge the gap between education and industry, aligning the needs of learners and employers. By addressing skills gaps, enhancing employability, promoting lifelong learning, and fostering strong industry-education partnerships, dual education serves as a promising model for the future of professional training.

Moving forward, several perspectives should be considered when implementing or expanding dual education in training future specialists, namely: continuous curriculum adaptation, increasing accessibility, emphasizing soft skills and strengthening industry-education partnerships. Ongoing collaboration between industry partners and educational institutions is crucial for ensuring the continued success of dual education programs.

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