MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
SUMY STATE UNIVERSITY
Educational and Research Institute of Business, Economics and Management
Department of International Economic Relations

«Admitted to the defense»
Head of the Department
_____ Yu.M. Petrushenko
(signature) (full name)
01.06.2024

QUALIFICATION PAPER
It is submitted for the Bachelor's degree

Specialty 292 "International Economic Relations"
on the topic "INTERNATIONAL COMPETITIVENESS OF NATIONAL EDUCATION (ON THE EXAMPLE OF GERMANY AND UKRAINE)"

Student 4 Course _____ B.O.Yevdokymova
(course number) (signature) (full name)
group ME-02a.ан
(group's code)

Qualifying Bachelor's paper contains the results of own research. The use of the ideas, results and texts of other authors has a link to the corresponding source

Research advisor Ph.D., Assoc.prof. _____ I.Ye.Yarova
(position, scientific degree) (signature) (full name)

Sumy, 2024

MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
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TASKS FOR BACHELOR'S DEGREE QUALIFICATION PAPER

(specialty 292 " International Economic Relations ")
student 4 course, group ME-02a.ан
(course number) (group's code)
Bohdana Oleksandrivna Yevdokymova
(student's full name)

1. The theme of the paper is INTERNATIONAL COMPETITIVENESS OF NATIONAL EDUCATION (ON THE EXAMPLE OF GERMANY AND UKRAINE) approved by the order of the university from «08» 0 5 . 2024 №0485-VI
2. The term of completed paper submission by the student is «29» 05. 2024.
3. The purpose of the qualification paper is determined is to analyze and compare the international competitiveness of the education systems in Germany and Ukraine, providing insights and recommendations to help Ukraine enhance its educational framework and align with international standards.
4. The subject of the research is evolution and prospects of international competitiveness of national education systems of Germany and Ukraine, serving as comparative case studies.
5. The object of the research is the international competitiveness of national education systems, specifically focusing on the educational frameworks of Germany and Ukraine.
6. The qualification paper is carried out on materials from the electronical sources.
7. Approximate qualifying bachelor's paper plan, terms for submitting chapters to the research advisor and the content of tasks for the accomplished purpose is as follows:

Chapter 1 Theoretical basis and analysis of the historical context of educational systems:

23.04.2024
(title, the deadline for submission)

Chapter 1 deals with the theoretical underpinnings and historical context of educational systems, focusing on the influence of historical factors on the development of education in Germany and Ukraine. It also explores the legislative foundations of national education competitiveness.
(the content of concrete tasks to the section to be performed by the student)

Chapter 2 Socio-economic analysis of secondary education competitiveness:

15.05.2024

(title, the deadline for submission)

Chapter 2 deals with a socio-economic analysis of secondary education competitiveness. It examines the structure and effectiveness of secondary education, comparing Germany and Ukraine. It analyzes the influence of financing on the quality of education and explores the interrelation between the two factors.

(the content of concrete tasks to the chapter to be performed by the student)

Chapter 3 Strategies for improving secondary education competitiveness:

20.05.2024

(title, the deadline for submission)

Chapter 3 deals with strategies aimed at enhancing secondary education competitiveness. It begins by examining the reforms implemented in Germany and their outcomes. Furthermore, it addresses the prospects and challenges associated with school reform in Ukraine.

(the content of concrete tasks to the chapter to be performed by the student)

8. Supervision on work:

Chapter	Full name and position of the advisor	Date, signature	
		task issued by	task accepted by
1	Inessa Yevhenivna Yarova, Ph.D., Associate professor	04.04.2024	23.04.2024
2	Inessa Yevhenivna Yarova, Ph.D., Associate professor	23.04.2024	15.05.2024
3	Inessa Yevhenivna Yarova, Ph.D., Associate professor	15.05.2024	20.05.2024

Date of issue of the task: «04» 04. 2024

Research advisor Ph.D., Assoc.prof. _____ I.Ye.Yarova

(position, scientific degree) (signature) (full name)

ABSTRACT

on bachelor's degree qualification paper on the topic

«INTERNATIONAL COMPETITIVENESS OF NATIONAL EDUCATION (ON THE EXAMPLE OF GERMANY AND UKRAINE)»

student Bohdana Oleksandrivna Yevdokymova

(full name)

The main content of the bachelor's work is laid out on 54 pages, including the list of used sources from 40 titles, which is placed on 6 pages. The work contains 7 tables, 7 figures.

Today, education is transforming into one of the most important components of socio-economic development, serving as a means by which humanity can address a range of global problems and ensure its survival. In the context of globalization and the internationalization of economic relations, education is tasked with one of the main functions in achieving human ideals: ensuring national competitiveness, scientific and technological progress, and sustainable development. By adopting the experience of successful Germany, Ukraine can enhance the quality of its education, ensure competitiveness in the global market, and contribute to the sustainable development of the country.

The purpose of the qualification paper is determined is to analyze and compare the international competitiveness of the education systems in Germany and Ukraine, providing insights and recommendations to help Ukraine enhance its educational framework and align with international standards.

The purpose of the work is realized by performing the following tasks:

- to conduct an overview on historical factors on the development of educational systems in Germany and Ukraine
- to analyze the legal frameworks that support national education competitiveness in both countries

- to investigate the factors contributing to the international competitiveness of national education systems in Germany
- to explore the structure of school education in both Germany and Ukraine, identifying key elements that contribute to educational quality and effectiveness.
- to investigate the role of providing multiple educational pathways
- to study the influence of socio-economic factors on secondary education quality
- to evaluate the outcomes of educational reforms in Germany
- to identify key obstacles and solutions for Ukraine's education system

In the process of research depending on the goals and objectives, were used a combination of general scientific methods, such as a comprehensive examination of existing academic papers, reports, and policy documents related to education systems, competitiveness indicators, and educational practices, alongside specific scientific (empirical) methods, including using statistical data sources such as international education rankings, enrollment rates, government spending on education, and economic indicators to assess the relative competitiveness of the education systems in Germany and Ukraine, and examining specific educational initiatives, programs, or institutions in Germany and Ukraine.

According to the results of the study the following conclusions are formulated:

1. The development of education in both countries has contributed to their integration into the international arena, shaping their economic development, competitiveness, skilled workforce, scientific and technological progress, as well as their presence on the international stage and in international cooperation.

2. Social and economic factors significantly influence the competitiveness of school education. Among them are funding and resource allocation, teacher quality and training, access to technology and educational resources, and educational infrastructure. Addressing social inequalities and ensuring equal access to resources determine the formation of competitive youth, shaping the future of the state.

3. Both Germany and Ukraine are currently modernizing and digitizing their education systems, integrating technology into teaching, lesson preparation, and providing online resources. This initiative aims to enhance education quality, student engagement, and skill development, while also offering flexibility in learning.

4. The educational sector in Ukraine faces several challenges, including inadequate funding, corruption, low teacher salaries, outdated teaching methods, unequal access to quality education, and ineffective governance.

5. Research on educational reforms in both countries has shown that Ukraine has the potential to strengthen its position in the education sector. This is achievable through further implementation of technology in education, enhancing teaching quality, and adopting European best practices.

The results developed in this work can serve as a basis for developing strategies and tactics aimed at strengthening the educational policy in Ukraine, modernizing educational programs, improving the quality of education, and creating a conducive environment for the development of talented young individuals.

The results of the approbation of the main provisions qualification paper were considered at:

1.Yevdokimova, B., Yarova, I. International competitiveness of national education: матеріали IV Міжн. наук.-практ. інтернет-конференції «Інноваційні рішення в економіці, бізнесі, суспільних комунікаціях та міжнародних відносинах». Дніпро: Ун-т митної справи та фінансів. 2024.

2.Yevdokimova, B., Yarova, I. Integration of Ukrainian education into the global educational space: International Economic Relations and Sustainable Development (Міжнародні економічні відносини та сталий розвиток): матеріали IV Міжнародної науково-практичної конференції, м. Суми, 21 травня 2024 року / за заг. ред. Ю. М. Петрушенка, М. Д. Домашенко. – Суми : Сумський державний університет, 2024.

Keywords: international competitiveness, educational systems, national economy, effectiveness, international experience, secondary school, quality.

The year of qualifying paper fulfillment is 2024.

The year of paper defense is 2024.

CONTENT

INTRODUCTION

The actuality of the topic. The issue of the international competitiveness of national education is highly relevant, as education is a crucial point in the economic and social development of any country. In the context of Ukraine, which is undergoing complex economic, political, and cultural transformations, the competitiveness of its education system is particularly pressing. Reforming the educational system, improving its quality, and aligning it with international standards are critical for the country's future development. Germany's experience can serve as a valuable example for enhancing Ukrainian education, facilitating its integration into the global educational community, and ensuring sustainable development of the national economy.

Level of the studied problem. Research on the development of national education systems, identifying global trends and challenges, is often conducted by specialists representing the UN, UNESCO, the World Bank, or the OECD and such scholars as S.Marginson, Hazelkorn E., Carnoy M., Kvit S., Lyshak V.. Despite numerous scientific studies, there remains a need to enrich the information on Germany with new facts, as well as to deepen and systematize the accumulated information and fundamental knowledge about the education and culture of this country.

The purpose of the qualification paper. The main goal of the study is to analyze and compare the international competitiveness of the education systems in Germany and Ukraine, providing insights and recommendations to help Ukraine enhance its educational framework and align with international standards.

The subject of the research is evolution and prospects of international competitiveness of national education systems of Germany and Ukraine, serving as comparative case studies.

The object of the research is the international competitiveness of national education systems, specifically focusing on the educational frameworks of Germany and Ukraine.

The main objectives of the study are:

- to conduct an overview on historical factors on the development of educational systems in Germany and Ukraine
- to analyze the legal frameworks that support national education competitiveness in both countries
- to investigate the factors contributing to the international competitiveness of national education systems in Germany
- to explore the structure of school education in both Germany and Ukraine, identifying key elements that contribute to educational quality and effectiveness.
- to investigate the role of providing multiple educational pathways
- to study the influence of socio-economic factors on secondary education quality
- to evaluate the outcomes of educational reforms in Germany
- to identify key obstacles and solutions for Ukraine's education system

Research methods. The study on the international competitiveness of national education systems, illustrated by Germany and Ukraine, employs a combination of general scientific methods, such as a comprehensive examination of existing academic papers, reports, and policy documents related to education systems, competitiveness indicators, and educational practices, alongside specific scientific (empirical) methods, including using statistical data sources such as international education rankings, enrollment rates, government spending on education, and economic indicators to assess the relative competitiveness of the education systems in Germany and Ukraine, and examining specific educational initiatives, programs, or institutions in Germany and Ukraine.

The information base. The information base of the study comprises a wide range of sources, including scientific articles, reports, legislative acts, research, and statistical data related to the educational systems of Germany and Ukraine. Additionally, data from

international organizations such as the QS World University Rankings, the Organisation for Economic Co-operation and Development (OECD), and Statista were utilized.

The practical significance of the research findings lies in understanding the historical, cultural, socio-economic, and legislative factors influencing educational outcomes in Germany and Ukraine, decision-makers can formulate targeted reforms to improve educational quality and accessibility. Additionally, insights into the role of vocational training and the integration of technological innovations can guide efforts to align education with the needs of the modern workforce. The research aims to contribute to the development of evidence-based policies and practices that support sustainable economic growth and social development in Ukraine.

1 THEORETICAL BASIS AND ANALYSIS OF THE HISTORICAL CONTEXT OF EDUCATIONAL SYSTEMS

1.1 Historical factors shaping the evolution of educational systems in Germany and Ukraine

Solving modern problems of vocational education is impossible without a historical analysis of its formation. Throughout its development, humanity has consistently tackled a crucial objective: transmitting labor and professional expertise to successive generations. The educational systems of Germany and Ukraine reflect the deep historical roots that have influenced their development over the centuries. Nowadays Germany is considered one of the most developed countries. Education in this country was formed under the influence of religious and socio-political factors, humanistic ideas of philosophers and educators, innovative transformations, paved the way for democratisation, and cooperation with other educational systems with great difficulty.

The oldest form of vocational training in Germany traces back to apprenticeships with craftsmen, dating to the early Middle Ages. Available to youths aged 12 to 18, this training typically spanned four years and was conducted through individual apprenticeships with a master craftsman. This tradition, persisting in Germany today, established the principle of personalized practical vocational training.[1]

During the 18th century, as the demand for theoretical knowledge grew due to the increasing complexity of tasks advised by masters, efforts to enhance schoolchildren's education began. This period saw the development of didactics and curricula, alongside the emergence of real schools (Realschule) in the Renaissance era, introducing a competitive educational model complementing workshop-based learning. [1]

In the early 19th century, spurred by industrialization and handicraft development, the state endeavored to improve vocational education. Vocational schools arose alongside initiatives to combat illiteracy, such as mandatory Sunday school attendance. In 1919,

Germany's Technical Education Committee systematized vocational school curricula, aligning training with enterprise needs. J. Meyser's research emphasized the key role of vocational education in economic progress, reflecting shifts in societal and educational norms. [2]

The unification of Germany in 1871 under Prussian leadership led to the centralization of educational policies and the establishment of uniform standards nationwide. Later, the Weimar Republic's progressive education reforms promoted child-centered learning and democratic values. However, the tumultuous events of the 20th century, including two World Wars and the division of Germany during the Cold War, had profound effects on the educational system. The post-war period saw efforts to rebuild and reform education, with a focus on promoting peace, democracy, and reconciliation. That time Germany was divided into Eastern (German Democratic Republic (GDR)) and Western (Federal Republic of Germany (FRG)) parts, the socialist and capitalist respectively. As it could be seen from the Table 1.1, vocational education in these two countries evolved differently. [3]

Table 1.1 – Development of education in GDR and FRG [3]

Educational Aspect	GDR	FRG
Education Management	The Central Administration of National Education was the sole governing body for public education.	A restored administrative division into federal states with corresponding education authorities in each state - the state Ministries of Education.
Development of Vocational Education	State-owned enterprises founded the initial vocational schools, with one-third operating within these enterprises by the late 1950s.	Vocational education started in the mid-1960s with reforms and was revitalized by the "Law on Vocational Education," regulating dual training.
Technological Progress	Significant changes occurred in education policy, primarily driven by scientific and	The pedagogy of vocational education shifted with the introduction of workplace

	technological advancements.	technology.

After the unification of the GDR and the FRG, vocational education in unified Germany underwent significant changes, reflecting not only the needs of political integration and democratization but also profound economic restructuring. Former state-owned enterprises transitioned to private ownership, prompting a shift in vocational education towards the West German model. [3]

Ukraine's educational history spans centuries, evolving from the Kyivan Rus' era in the 9th century. Public education, crucial for literacy and knowledge, expanded over time, offering various accessible learning forms. Volodymyr's forward-thinking policies aimed to prepare educated individuals for governance, fostering literacy through schooling. HIn cases where it was not possible to attend public schools, children were educated at home. Parents, older villagers or clergy took responsibility for teaching children, providing them with reading, writing and computing skills. The Cossack Hetmanate era established community-based brotherhood schools, providing basic education, though access remained limited mainly to the nobility and clergy. The 19th-century Ukrainian National Revival sparked renewed interest in Ukrainian language and culture, fostering modern literature and clandestine educational initiatives.-language schools, despite official restrictions imposed by imperial powers. [4]

The early 20th century brought political upheaval, including the establishment of the Ukrainian People's Republic in 1917 and struggles for independence. These events shaped educational policies, with efforts to promote Ukrainian language and culture amid Soviet attempts to impose Russification. It prioritized the development of a national educational system that emphasized Ukrainian language instruction and the promotion of Ukrainian history, literature, and culture. However, the Soviet regime's policies aimed at Russification posed significant challenges to Ukrainian language education and cultural expression, leading to suppression and censorship of Ukrainian-language schools, publications, and cultural institutions. [4]

Despite obstacles, Ukrainian educators, intellectuals, and cultural figures resiliently preserved Ukrainian language and culture during the Soviet era. Centralized control over education emphasized ideological indoctrination and standardized programs. At the same time Ukraine's educational system expanded, achieving near-universal literacy and basic education access. The regime focused on building educational infrastructure, especially in rural areas, and enforced compulsory education laws. Advancements in science, technology, and financial aid increased access to higher education.[5]

Since gaining independence in 1991, Ukraine has embarked on a journey of educational reform, seeking to modernize and democratize its educational system while preserving its cultural heritage. These efforts include revising curricula, updating teaching methods, and integrating technology in classrooms to promote critical thinking and innovation. Inclusivity and equal access to education are prioritized, yet challenges like underfunding and corruption persist.[4]

In both Germany and Ukraine, the development of education has been shaped by various historical and political changes. In Germany, this meant decentralization and the advancement of vocational and technical education during the post-World War II reconstruction period. Meanwhile, Ukraine has undergone a complex journey, advocating for language and cultural rights. Key stages in its educational system formation include the Cossack Hetmanate period, the Ukrainian National Revival, and contemporary reforms aimed at implementing modern teaching methods.

1.2 Concept and components of national education competitiveness: legislative foundations

There is no doubt that education holds a pivotal position in shaping societal progress and global competitiveness. Across nations, there is a growing recognition of the imperative for high-quality education, extending beyond the development of a skilled workforce to encompass broader economic, social, and cultural advancement. As educational frameworks evolve and innovative practices are integrated, they become essential catalysts for fostering sustainable economic growth and prosperity, particularly in developed nations. Central to this trajectory is the assurance of educational quality, which significantly influences the effectiveness and competitive edge of national educational systems.

Conducting an analysis of the competitiveness of educational institutions requires considering legislative, economic, social, and global aspects. As shown in Figure 1.1, the right to free education, educational mobility, and quality and affordable educational services are key to ensuring equal opportunities. Free access to education guarantees that all citizens can obtain education without financial barriers. Educational mobility allows students to choose institutions and programs that meet their needs and goals. Quality and affordable educational services require continuous improvement of standards and ensuring accessibility. All these factors enhance the national competitiveness of education. [6]

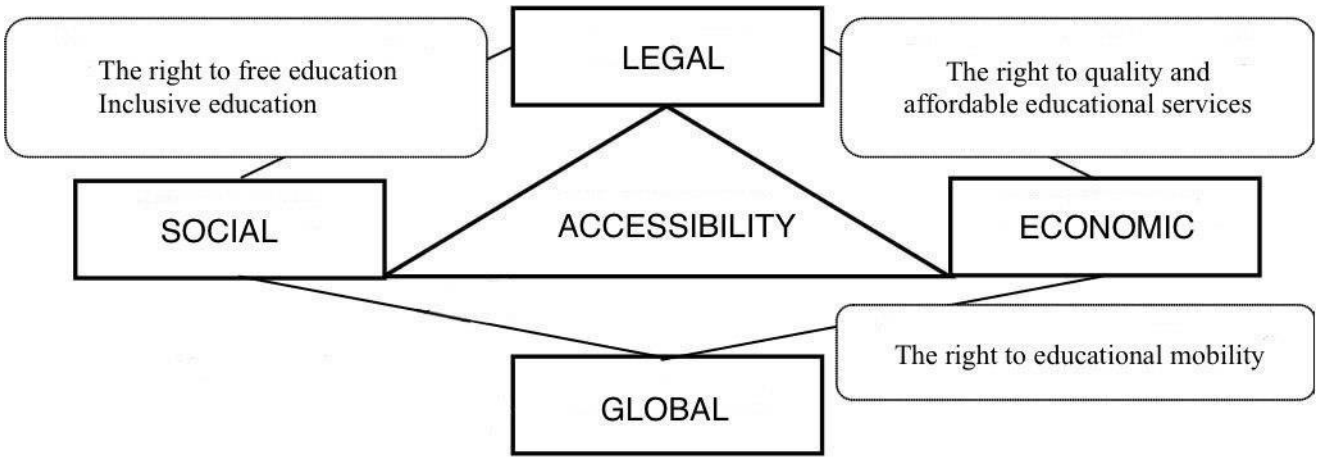

Figure 1.1 – The Interconnection Between Legal Factors and National Education Competitiveness [6]

The legal framework for ensuring the quality of education in Germany includes a wide range of laws and regulations governing this area. One of the key documents is the Education and Training Act (Bildungsgesetz), which establishes the general principles and goals of education in the country. The bylaws in this area are the Bildungsstandardsverordnung, which define the requirements for the content and quality of curricula and are evaluated through national tests. [7]

The structure of the German education system has its own peculiarities, in particular, the organization of the educational process is the responsibility of the federal states, while the central federal government plays a minor role. Moreover, the responsibility for the remuneration and pensions of civil servants (e.g. teachers, professors and junior professors) also lies with the federal states. The functioning of the education system and the organization of the educational process in Germany is regulated by a number of legal acts (at the level of the federal government and at the level of the federal states). Most legislative initiatives relate to methodological approaches to building the education system and are the responsibility of the federal government, whose powers are defined by law.[8]

The powers of local authorities to regulate the education sector are defined by a number of legislative acts. If federal legislation does not cover certain aspects of education, the federal states have the right to adopt their own legislation. This leads to discrepancies and differences in the education systems in the 16 federal states. In particular, in the German education system, this right extends to school education, higher education, adult education and continuing education. The management of the educational system in these areas is almost exclusively the responsibility of the federal states. [8]

The central authority in Germany for implementing state policy in the field of education is the Federal Ministry of Education and Research, which develops policy guidelines in the field of education and research and adopts relevant laws and administrative regulations. The scope of the Federal Government's responsibilities in the field of education is defined in the Basic Law, according to which the Federation bears

responsibility particularly for the regulations governing the following domains of education, science and research:

- In-company vocational training and vocational further education
- Admission to higher education institutions and higher education degrees (here the Länder may enact laws at variance with the legislation of the Federation)
- Financial assistance for pupils and students
- Promotion of scientific and academic research and technological development
- Child and youth welfare (in particular early childhood education and care in day-care centres and child-minding services)
- Legal protection of participants of correspondence courses
- Regulations on entry to the legal profession
- Regulations on entry to medical and paramedical professions
- Employment promotion measures as well as occupational and labour market research [7]

The Ministry works closely with local governments (federal states) to coordinate all activities of educational institutions, organizations and foundations. However, there are areas of cooperation in education for which there is no such distinction between the two parts, known as "joint tasks" or "Gemeinschaftsaufgaben". [7]

As for the mechanisms of education quality control, Germany has a system of external independent evaluation, which is organized by the Central Institute for Student Assessment (Centralstelle für die Bewertung der Leistungen der Schüler). This body administers standardized tests and evaluates students' academic achievements. There are also accreditation bodies that are responsible for assessing the quality of educational institutions and programs, such as the Federal Agency for Quality Assurance in Higher Education (Akkreditierungsagentur für Studiengänge im Hochschulbereich) and the State Agency for School Accreditation (Staatliche Agentur für Schulaufsicht). [8]

In December 2004, the Institute for Quality Assurance in Education (Institut zur Qualitätsentwicklung in Bildungswesen - IQB) was established in Berlin to check the level of quality assurance in German secondary schools. [8] At the same time, there are regional government bodies that oversee the implementation of education legislation and assist educational institutions in improving the quality of education and meeting the requirements of standards. These bodies are, for example, the Landesministerium für Bildung und Kultur (Ministry of Education and Culture) and the Bundesministerium für Bildung und Forschung (Ministry of Science and Research). [9]

Thus, the issue of quality has always been at the center of the German government's educational policy, which has sought to regulate all aspects of assessment and direct educational activities to improve the quality of general secondary education. This is evidenced by the development of a legislative framework, the approval of uniform standards for different levels of education, the participation of German general education institutions in international comparative studies, and the creation of the Institute for Quality Assurance in Education.

Given the German state structure, the functioning of the education model is based on the principle of federalism. Since Ukraine is a unitary state, the way the German education system is organized cannot be a direct example for Ukraine to follow. The legal framework for ensuring the quality of education in Ukraine is based on legislative acts regulating educational processes, standards and mechanisms for monitoring the quality of education. One of the key documents is the Constitution of Ukraine, which guarantees the right to quality education for every citizen. Powers in the field of education are defined by the Constitution and the Laws of Ukraine "On Education", "On Higher Education", "On General Secondary Education" and other regulatory acts. According to Art. [10] 16 of the Law of Ukraine "On Higher Education", the system of quality assurance of higher education in Ukraine includes:

1) systems for ensuring the quality of educational activities and the quality of higher education by higher education institutions (internal quality assurance system);

2) systems of external quality assurance of educational activities of higher education institutions and quality of higher education;

3) quality assurance systems of the National Agency for Quality Assurance in Higher Education and independentinstitutions for assessing and ensuring the quality of higher education. [11]

The Ministry of Education and Science of Ukraine is the main education authority in the country. It is responsible for developing and implementing strategies to ensure the quality of education, defining learning standards and assessing students' knowledge. The Ministry also coordinates the activities of regional education authorities and ensures the implementation of educational regulations throughout the country. [12]

At the regional level, education is managed by regional and city education departments. They are responsible for organizing the educational process, monitoring compliance with standards and quality of education, and developing the educational infrastructure on their territory. [12]

The respective governmental bodies, the State Service of Education Quality of Ukraine (SSEQU) and the Ukrainian Centre for Educational Quality Assessment (UCEQA), jointly oversee the country-level aspects of quality assurance in education. Established in 2017, the SSEQU is tasked with the external evaluation and support of educational institutions to uphold standards of educational quality. Meanwhile, the UCEQA conducts independent evaluations of students' learning outcomes at specific educational levels and conducts monitoring studies to assess the overall quality of education in Ukraine. [10]

Central to the external evaluation framework is the institutional audit process, which entails a comprehensive analysis of school operations to identify strengths and areas for improvement. Drawing upon international standards and best practices, this process provides valuable insights and recommendations for the continual development of educational institutions. The audits encompass various critical areas such as the learning environment, student assessment systems, pedagogical approaches, and school

management practices, evaluated against meticulously crafted criteria to ensure a thorough assessment. Through these audits, Ukrainian schools are empowered to continually refine their practices and align with the evolving demands of the contemporary educational landscape. [10]

Comparative analysis of the legal frameworks and mechanisms for quality assurance in education in Germany and Ukraine reveals a number of similarities and differences. Both countries have legislation establishing standards of educational quality and mechanisms for their maintenance. In order to assess student achievements at the national level, both countries utilize external evaluation.

Among the differences, the organizational structure of education management stands out: Germany has a federal system, where quality control in education is carried out at the level of federal states, while in Ukraine, this function is centralized. The mechanisms of control also differ: in Germany, the emphasis is placed on auditing procedures, whereas in Ukraine, it is on external evaluation and state inspections.

The level of standardization also varies: in Germany, standards depend on each federal state, whereas in Ukraine, they are more often nationally established norms. The impact on the competitiveness of each country's educational systems is determined by the effectiveness of legislation and control mechanisms, which can ensure high-quality education and workforce preparation. However, differences in approaches and the level of standardization may affect the effectiveness of the quality control system.

2 SOCIO-ECONOMIC ANALYSIS OF SECONDARY EDUCATION COMPETITIVENESS

2.1 The structure of secondary education and its effectiveness: a comparison of Germany and Ukraine

Germany has created one of the best educational systems in the world: education is free and universal, and schooling is compulsory for all citizens. These successes make its educational institutions a good example for other countries and demonstrate the government's interest in raising the prestige of education at all levels. Its education system is quite extensive and complex. However, it has traditional segments same as in Ukraine: preschool, school, vocational and higher education. An important feature of this education system is the early identification and tracking of a student's educational trajectory.

Typically, compulsory schooling begins for all children in the Federal Republic of Germany at the age of six and entails nine years of full-time education. Germany consists of 16 federal states, each of which regulates its own education system through state governments rather than the federal government. The German education system is characterized by differences among the federal states (Bundesländer).[7]

Primary education is provided in primary school forms 1 to 4 or 1 to 6 (in Berlin and Brandenburg) within general education schools. The curriculum is uniform across all grades, with the primary goal being to prepare children, primarily through playful methods, for more systematic forms of schooling. Following primary school, typically after the fourth grade (or after the sixth grade in Berlin and Brandenburg), students undergo an early division into educational tracks: teachers and parents jointly decide which secondary school to enroll the child in, depending on their academic performance.[13]

In Ukraine, compulsory schooling typically begins for all children at the age of six and entails nine years. The education system in Ukraine is centralized, with the Ministry of Education and Science overseeing educational policies and standards at the national level. Primary education, which encompasses grades 1 to 4, is provided within general education schools. In Ukraine, there is no early tracking or streaming based on academic performance in primary and secondary schools. Children usually attend the same school from the first to the last grade, but they can change to a gymnasium or lyceum according to their own desire.[15] Furthermore, in Germany there is a law that obliges children to study and attend school. If a child does not show up for classes without a reason, there may be consequences primarily for the parents or guardians. [13]

Secondary education in Germany is provided by secondary general education schools, divided into the first (Sekundarbereich I) and second (Sekundarbereich II) stages. In most federal states, the following primary types of secondary general education schools are available in the first stage:

- Hauptschule (secondary general school)
- Realschule (secondary school)
- Gymnasium (academic secondary school)
- Gesamtschule (comprehensive school)
- Sonderschule (special school)

Secondary education of the second stage includes:

- Vocational schools
- Vocational specialized schools
- Additional vocational schools
- Advanced specialized schools
- Vocational gymnasiums
- Intermediate vocational educational institutions (technical colleges)

- one-year pre-vocational training or one-year basic vocational training schools[7]

In most federal states, the primary types of secondary general education schools of the first stage include Hauptschule, Realschule, Gymnasium, Gesamtschule, and Sonderschule. For the characterization of the main indicators of school types would be used the data from Table A.1, outlined in Appendix. These secondary education institutions differ in the duration of study and qualifications upon completion. However, the German system of secondary education is relatively open, allowing students to transition between different courses, particularly in vocational schools. Additional qualifications can also be obtained later in vocational-technical institutions, adult education institutions, or through external studies. [14]

In contrast to Germany's diversified secondary education system, Ukraine's structure comprises two main cycles: basic (grades 5-9) and upper (grades 10-12) secondary education. While Germany offers a range of secondary schools like Hauptschule, Realschule, and Gymnasium, Ukraine primarily provides comprehensive secondary schools covering both cycles. Standardized testing, particularly through the External Independent Testing system, plays a crucial role in Ukraine, determining access to higher education. While Ukraine offers vocational education, it's often separate from general secondary education, unlike Germany's integrated approach. Transitioning between courses or institutions is less common in Ukraine, and additional qualifications through vocational-technical or adult education are less prevalent. [16]

The diversity of educational opportunities in the German education system, as evidenced by the number of different types of schools, reflects its responsiveness to market needs. Analysis of the data from Figure 1 reveals that academic secondary schools (3156 schools) and special schools (2795 schools) constitute the largest proportion. This shows a strong focus on preparing students for higher education to cultivate a highly skilled workforce aligned with contemporary labor market demands, as well as providing inclusive education for individuals with special needs to uphold principles of social justice.

In addition, it is worth noting that a significant number of comprehensive schools (2,210 schools) and general secondary schools (1,717 schools) provide a more general and diverse education, covering a wide range of subjects and helping students develop a variety of skills that may be beneficial for their future in professional and personal fields. A balanced education system can directly impact a country's economy by increasing productivity, and contributing to sustainable economic development and competitiveness.

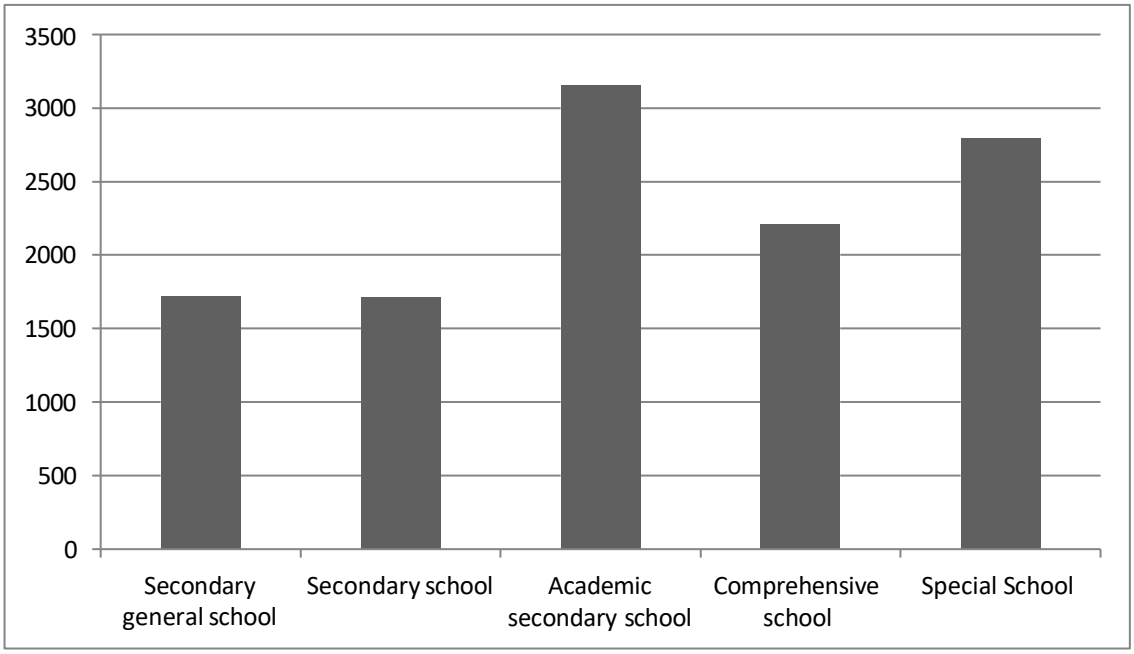

Figure 2.1 – Number of general schools in Germany in the 2022/2023 school year, by school type [17]

When comparing the structure of education systems of Germany and Ukraine, it can be concluded that the structure of the school system in Germany is hierarchical with different types of schools such as Gymnasium, Real School, Main School, etc. that focus on different pathways of education and vocational training, while in Ukraine there is a general structure of primary, basic and secondary schools, as well as vocational education.

The second important difference is the duration of education. In Germany, the duration of schooling can vary depending on the type of school and level of education, while in Ukraine the total duration of schooling is usually 11 years.[16] The third aspect

concerns qualifications and certification. In Germany, after completing each level of education, students receive certificates with different levels of qualification, such as the "Realschule" or "Gymnasium". Ukraine also has its own certificates, such as the "Certificate of Complete General Secondary Education", which gives the right to enter higher education institutions.

The dual education system in Germany is popular because it combines theoretical studies with practical training in a work environment. Many companies sponsor students' studies or pay for their internships, and some students receive scholarships from the state. Dual education gives students the opportunity to gain practical work experience while studying and facilitates their entry into the labour market. For companies, this means the ability to train young professionals according to their needs, but the system also has its challenges, such as the need to constantly adapt to changes in the economy and technology and insufficient funding. [15]

The higher education system in Germany is a highly complex and well-structured system consisting of different types of educational institutions. Higher education in Germany includes various types of institutions, such as universities (Universitäten), professional higher education institutions (Fachhochschulen or Hochschulen für angewandte Wissenschaften), technical universities (Technische Universitäten) and colleges (Berufsakademien). [7]

The main difference between universities and vocational schools is the academic orientation and teaching methods. Universities usually specialise in theoretical research and scientific work, while vocational schools focus more on practical aspects of learning that can be applied directly in the workplace. Each of these types of institutions has its own characteristics and specialisations. Higher education institutions in Germany offer a wide range of study programmes at different levels, including Bachelor's, Master's and PhD. Programmes can be focused on various fields of study, from the humanities and social sciences to engineering and natural sciences.

Between 2019 and 2022, Germany will see certain trends in the number of students in higher education and apprenticeships. The Table 2.2 shows that the total number of students in higher education is on an upward trend from 2019 to 2021, but will decline slightly in 2022. Similarly, the number of apprentices is decreasing from 2019 to 2022.

Table 2.2 – Comparison of number of students in universities and vocational schools 2019-2022 [18-19]

Year	Number of vocational trainees, in millions	Number of students in universities, in millions
2019	1.33	2.89
2020	1.29	2.94
2021	1.26	2.95
2022	1.22	2.92

A decline in apprenticeships could lead to a shortage of skilled workers in industry, complicating production processes and raising wage costs. This decline may be due to increased automation and robotics in manufacturing, which boosts productivity but poses challenges for job availability. Growing demand for higher education and intellectual labor can significantly impact the labor market and social development. Stable demand for higher education suggests increased demand for intellectual labor like engineers and programmers. However, this may exacerbate social inequality without ensuring access to higher education for all. Therefore, developing retraining and lifelong learning systems is crucial for workers to adapt to changing job requirements, maintaining social stability and enhancing labor market competitiveness.

It is important to note that the presence of international students significantly enhances the competitiveness of national education systems by contributing to cultural diversity, supporting economic vitality, facilitating global networking, addressing skill shortages in critical sectors, and strengthening international diplomatic relations. As it could be seen from Table 2.3 Germany is successfully competing for international students by attracting them to its universities, even in comparison to English-speaking countries.

Thus, in 2023, Germany became the third most popular country for international students and the first among countries where English is not spoken. The majority of international students are non-residents, and their number is growing every year. The number of residents among international students remains relatively stable, and changes slightly from year to year. This may be the result of both the high quality of education and other factors, such as accessibility of programmes, cultural diversity, and career opportunities after graduation, which demonstrates the high competitiveness of national education.

Table 2.3 – International Students in German Higher Education 2018-2023 [20]

Winter Semester	Total International Students	International Students	Resident International Students
2022/2023	458,210	367,578	90,632
2021/2022	440,564	349,438	91,126
2020/2021	416,437	324,729	91,708
2019/2020	411,601	319,902	91,699
2018/2019	394,665	302,157	92,508

To compare, in 2023 there was a significant increase in the number of vocational education students in Ukraine from 243,825 in 2022 to 331,488. [21]Also, the total number of students enrolled in higher education decreased from 1,335,690 in 2022 to 1,112,965 in 2023. Comparing this data with Germany, it can be noted that Germany has a very developed system of apprenticeships and vocational education, which contributes to the high level of workers' qualifications and stable functioning of the industry. [22]

An increase in the number of vocational students in Ukraine may indicate certain positive trends in society, such as a growing awareness of the importance and value of vocational education and skills. However, the decline in the overall number of students requires attention to possible causes, such as economic and political difficulties, demographic trends, and changes in education policy. As for international students, Figure 2.2 shows that compared to the pre-war years, the statistics of foreign students in Ukraine have decreased significantly.

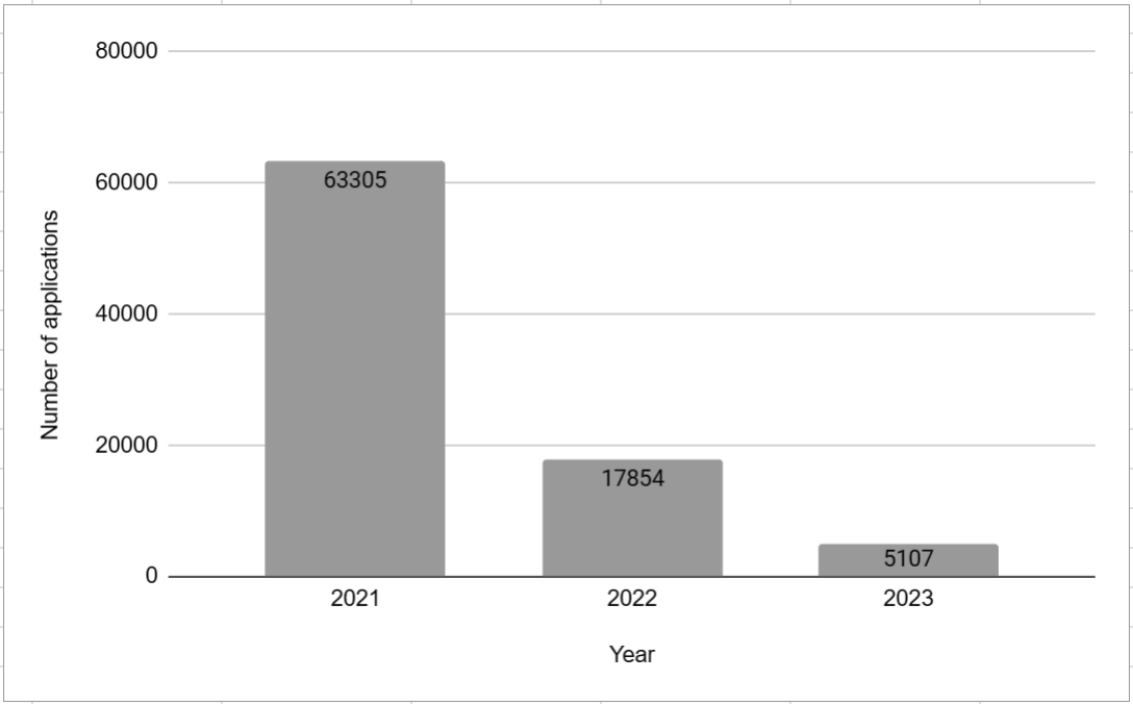

Figure 2.2 – Applications number of international students 2021-2023 [23]

Among the reasons why some foreign students give up their intention to enter Ukrainian higher education institutions is not only fear for their lives in a country that is suffering from armed aggression by a neighbouring state, but also logistical problems. Currently, Ukraine has no direct flights to other countries, which makes it difficult to get to the country. Many of international students come from countries of so-called "migration risk", so European countries are very cautious about granting them transit visas because they are not sure that the foreign student will not stay on their territory but will actually go to Ukraine.[23]

When comparing the education systems of Germany and Ukraine, first country demonstrates an efficient education structure with a strong emphasis on vocational training, integration of practical experience and close cooperation with industry, which contributes to the high employability of graduates and the country's competitiveness. The Ukrainian education system, while having a strong academic base, faces challenges such as

underfunding and weak vocational training, which reduces its efficiency and global competitiveness.

Ukraine could improve its education system by adopting such several strategies from the German experience as introducing a dual education system, attracting international students through English-language programmes, investing in infrastructure, and implementing educational reforms. The integration of these aspects will increase the socio-economic impact of its education and competitiveness on a global scale.

2.2 The influence of financing on the quality of education: analysis and interrelation

The socio-economic processes taking place in the world today indicate a significant increase in the role of education in all spheres of social life, including the knowledge economy. As a crucial element of social life and state structure, the system is designed to contribute to the solution of such strategic tasks for the country as training personnel, ensuring political and social stability, developing civil society institutions, and strengthening the security of citizens and the state. As illustrated in Figure 2.3, the quality of education is not solely determined by academic curriculum and teaching methodologies; it is profoundly influenced by a myriad of cultural, political, and financial factors. The management of the competitiveness development of a general secondary education institution, as a certain integrated quality, is aimed at ensuring the constant competitiveness of staff, students and teaching and teaching aids. [24]

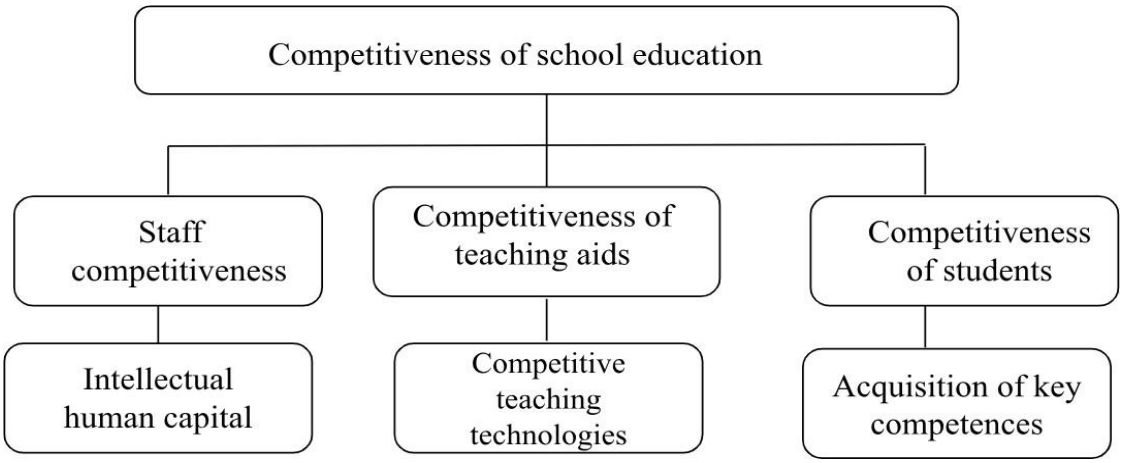

Figure 2.3 – Components of competitiveness in school education [24]

Financing of school education is an important component of society's development, as it determines the accessibility and quality of education for the younger generation. As outlined in Appendix the Table B.4, Ukraine and Germany represent different models of financing and management of educational systems. Advantages of centralised funding in Ukraine are that it ensures an even distribution of resources across the country, which helps to reduce disparities in access to education between regions. It is also worth noting that the existence of state curriculum standarts ensures homogeneity and the same level of education across the country. [25]

A significant disadvantage is the insufficient funding from the central budget, which often limits the capacity of schools and leads to insufficient funding for educational programmes and materials. In addition, the dependence of local governments on state subventions can lead to delays and instability in funding, and the limited autonomy of schools in a centralised system can limit their flexibility and innovation.[26]

In Germany, school funding is based on a federal system, which allows for a high level of autonomy for the Länder. This allows educational programmes to be adapted to local needs and specifics, which is an advantage of this model. In addition, the combination of state and local funding ensures stability and sufficient resources, and the

high level of economic development of the country allows for adequate funding of schools, which contributes to quality education. However, the large autonomy of the Länder leads to differences in the level of education between different regions. In addition, a federal system can be more difficult to manage due to the need for coordination between different levels of government. [25]

According to Figure 2.4, over the past ten years, education spending in Ukraine has grown significantly, showing a steady increase, especially during the war. In particular, the education budget grew from UAH 24 billion in 2014 to UAH 171.2 billion in 2024. The main source of this growth was the educational subvention to local budgets, which allowed to support the salaries of teachers and provide the necessary resources for education. This shows that despite the economic and political difficulties, education remains an important priority for public funding, which underscores its importance for the country's future development. [26]

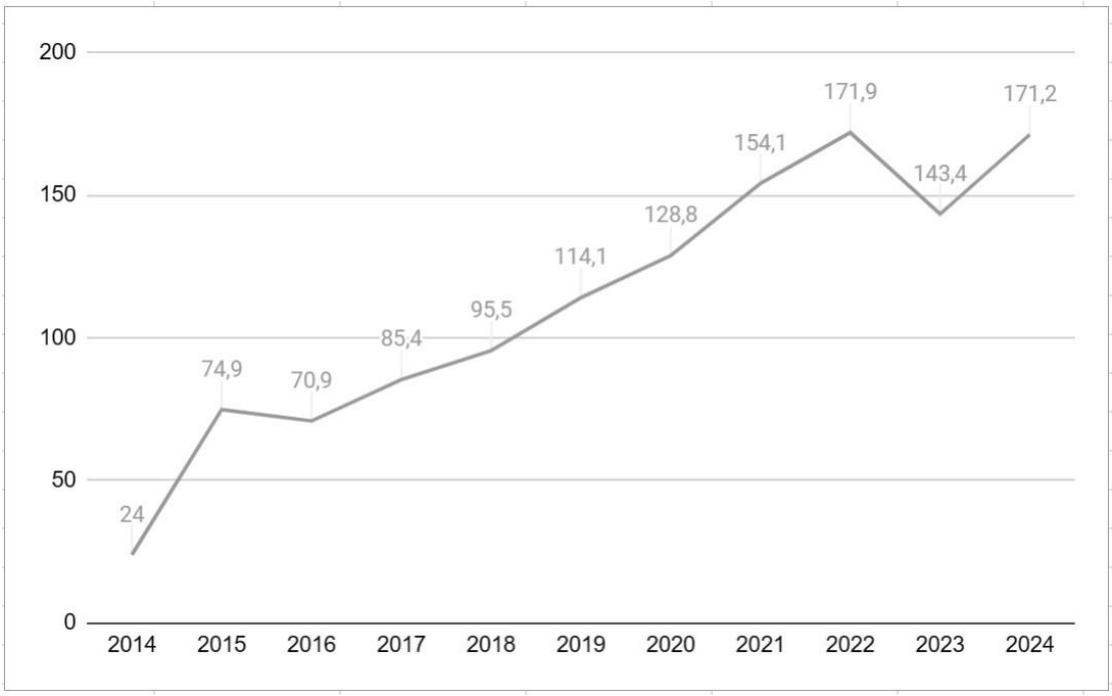

Figure 2.4 – Expenditure on education in Ukraine over the last 10 years [27]

Over the past decade, Germany has consistently increased its investment in education, with government expenditure rising significantly from 2011 to 2021, reaching 4.9% of GDP. This growth reflects Germany's commitment to enhancing educational infrastructure, teacher salaries, and learning resources, emphasizing high standards, advanced research, and innovation. In contrast, Ukraine's education spending has faced significant challenges due to ongoing conflict. From 2011 to 2021, the percentage of GDP allocated to education fluctuated, often declining, with research funding dropping from 0.7% to 0.3% of GDP. The war has strained Ukraine's financial resources, complicating sustained investment in education, though efforts have been made to adapt by increasing digital learning initiatives and rebuilding infrastructure under adverse conditions. [28]

There are many aspects that affect the quality of education in schools, but the next one of the most important is the availability and quality of staff. Teachers are responsible not only for imparting knowledge, but also for shaping personal qualities, developing critical thinking and creative abilities of students. In order to become competent and effective teachers, future teachers need to receive high-quality training provided by universities. In addition, university education contributes to the development of professional skills in future teachers, such as lesson planning, assessment, and adaptation of programmes to individual student needs. [29]

Analyzing the Figure 2.5, it should be noted that the distribution of universities in Germany by type reflects the diversity of the country's higher education system, which contributes to the development of various aspects of the economy and society. The low number of teacher education universities in Germany can be explained by several reasons. Firstly, university teacher education in Germany often takes place within general universities and universities of applied sciences, where specialised teacher education courses and programmes are offered. Secondly, the German education system is generally oriented towards higher education with a research focus, and teacher education often aligns with general academic standards. This approach allows for efficient use of resources and

ensures that teacher education is integrated with the needs of the modern educational environment. [29]

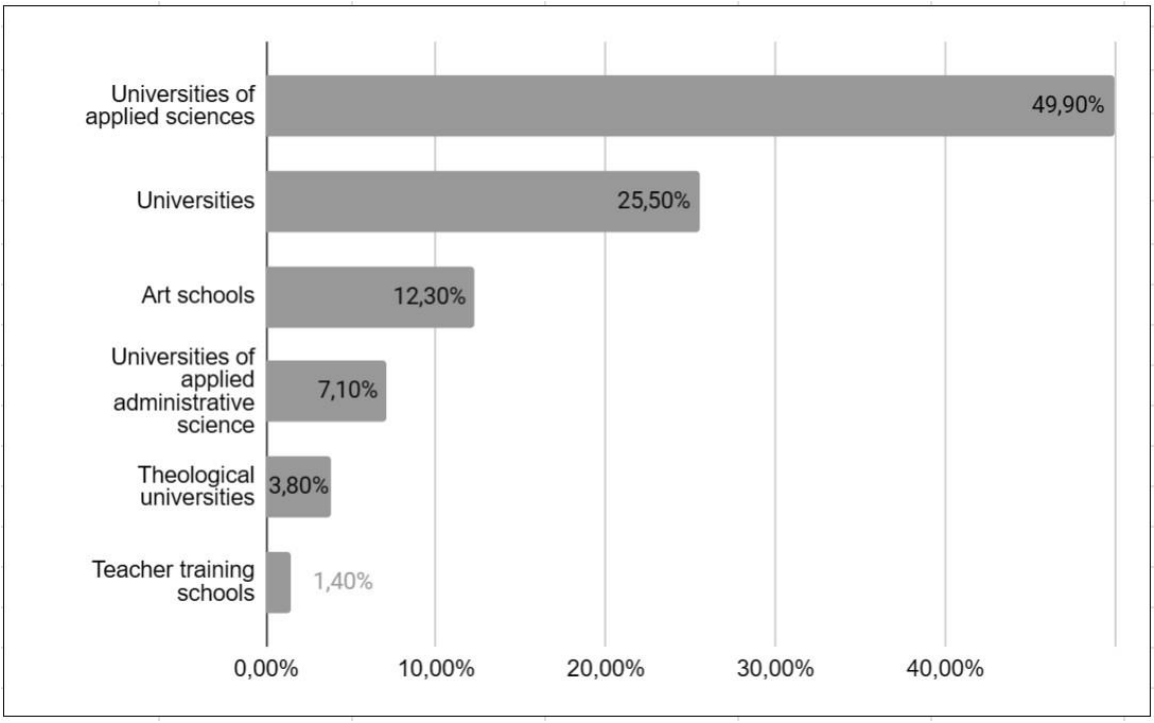

Figure 2.4 – Distribution of universities in Germany in the winter semester 2022/2023, by type of university [29]

Generally, higher education in Germany is a brand defined by a combination of affordability, high living standards and career prospects. Four German universities are among the top 100 universities in the world, according to the QS World University Ranking 2024 (Tab. 2.5). [30]

Table – QS World University Ranking 2024 [30]

Place	University
37	Technical University of Munich
54	Ludwig-Maximilians-Universität München
87	Universität Heidelberg
98	Freie Universitaet Berlin

According to the Ministry of Education and Science of Ukraine, as of 2022, there are more than 300 higher education institutions in Ukraine that offer education to future teachers in various fields. These institutions offer specialised teacher education programmes for different levels of education and subject areas. However, the teacher education system in Ukrainian schools faces a number of challenges, including insufficient funding for education, limitations in the provision of necessary equipment and teaching materials, and insufficient preparation of teachers for modern teaching methods and interactive technologies. [31]

Certainly, there are prospects for further development and improvement of the teacher training system. For example, the development of in-service training and professional development programmes for teachers to master modern teaching methods and technologies, as well as the involvement of external experts and practitioners to conduct workshops and trainings.

To summarise, in Germany, financial resources in education are predominantly public, which contributes to large investments in higher education, research and infrastructure, which in turn contributes to high quality education and scientific achievements. Ukraine, on the other hand, has limited funding for education, which leads to insufficient infrastructure, outdated teaching materials and insufficient teacher pay, which negatively affects the quality of education and staff motivation. To improve the situation, Ukraine needs to develop effective policy strategies and provide sufficient resources to ensure quality education.

3 STRATEGIES FOR IMPROVING SECONDARY EDUCATION COMPETITIVENESS

3.1 German experience: reforms in education and their results

The quality of education in Germany is well known worldwide for its organisation and accessibility for all students. The German education system allows students to continue their studies up to university level, regardless of their family's financial situation. Public schools in Germany - whether primary, secondary or vocational schools - generally do not require tuition fees, making education accessible to all. This contributes to the high international competitiveness of the German education system, making it attractive to students from all over the world.

The dual education system in Germany, which was introduced in 1969 and has since become the basis of vocational education in the country, plays a crucial role in secondary education, providing skilled workers with a combination of theoretical training and practical training in companies. The programme allows students to work in companies for several days a week, gaining practical skills that enhance their qualifications and employability after graduation. According to the OECD, about 81% of adults aged 25 to 64 in Germany have completed vocational or general secondary education, which is higher than the OECD average of 78%. Also, in the context of the dual system, Germany has a tertiary education attainment rate of 31%, slightly higher than the OECD average of 28%. [32]

Early career guidance, introduced in Germany in 2003, is an important reform in the secondary education system. The programme aims to help students identify their interests and abilities in order to make informed choices about their future career path. This includes counselling sessions where students are given the opportunity to consult with psychologists and other educational and career specialists. Students also take part in practical classes and internships, which helps them gain real-world experience in various fields and identify

their preferences and abilities. By pre-orienting and preparing students to choose their future career path, early career guidance programmes contribute to creating a better balanced labour market and ensuring that each student is supported in making important life decisions. [32]

An important step in education was the inclusive education reform implemented in Germany since 2009. The signing of the UN Convention on the Rights of Persons with Disabilities obliged countries to ensure accessible and quality education for all children, including those with special educational needs. Inclusive education involves integrating students with different educational needs into the same classes as other students. This means that children with disabilities study alongside their peers in mainstream schools. These classes provide the necessary support and resources for all students to succeed, regardless of their needs. One key aspect of inclusive education is creating an environment that promotes social cohesion. Students with disabilities have the opportunity to interact and learn with other children, fostering tolerance, understanding, and support for each other. [33]

Since 2016, the "DigitalPakt Schule" initiative has been a catalyst for significant changes in the German education system, introducing significant investments in the development of digital infrastructure in schools. This initiative was aimed at modernising the technical equipment of schools, providing high-speed Internet and developing digital learning platforms. The plan is to spend about €5 billion on these purposes by 2024. An important aspect of this reform is to ensure equal opportunities for all students. Investing in digital infrastructure reduces the difference in access to modern technology between schools and provides students with a level playing field. In addition, it stimulates the development of digital literacy skills among students, which is essential for their successful adaptation to the modern world. [34]

Additionally, to mitigate the effects of COVID-19 on children's education, Germany introduced the "Catching up after Corona for Children and Youths" program. This initiative, funded by the Federal Government with Euro 2 billion, aimed to address

learning gaps among pupils. Under Program Pillar 1, the Federal Government allocated Euro 1 billion annually to the Länder, with an equal contribution expected from each Land. The Länder implemented measures within existing structures to tailor support for students' learning needs. This approach ensured that interventions were specifically designed to address individual learning deficits. [34]

Since 2000, Germany has been focusing on the integration of international standards into its education system. One of the key tools for implementing international standards is exchange programmes such as Erasmus+ and other bilateral agreements. These programmes provide students and teachers with the opportunity to participate in international exchanges, internships and cooperation projects with other countries. International exchanges allows German students and teachers to learn about different approaches to teaching and educational management, which helps to improve their own practice and enhance the quality of education. In addition, this reform contributes to the international competitiveness of German education. The adoption of international standards and the exchange of experience allows German participants to be more adaptable and competitive in the global educational environment. [34]

In 2023, Germany's 7-point drop in the IMD World Competitiveness ranking indicates the need for further reforms in the country. This suggests that the efficiency and adaptability of the education system needs to be improved to meet the requirements of the modern world. For example, it is necessary to introduce digital technologies more actively into the educational process, improve the quality of education and prepare teachers for digital transformation. It is also important to develop innovative approaches to education to ensure the sustainability of the competitiveness of the economy and society as a whole. [35]

Table – Germany in The IMD World Competitiveness Ranking 2019-2023 [35]

Year	Place
2019	17
2020	17

2021	15
2022	15
2023	22

To address current challenges, in March 2023, the Standing Conference initiated reforms to further align the structural framework of upper secondary education. This response is in line with the political agenda outlined in the "Länder agreement on the common basic structure of the school system and the overall national responsibility of the Länder in central education policy issues" of October 15, 2020. [34]

One significant aspect of these reforms is the strengthening of social science subjects, now requiring a minimum of six school semesters, up from four previously. Additionally, science subjects will now be taught for a standard three hours at the basic level, ensuring a more comprehensive understanding. Moreover, preparing students with essential digital skills for an increasingly digitized world is now an integral part of the upper secondary school curriculum.

The German experience in education reforms has yielded notable results. Through systematic reforms, Germany has enhanced the quality and effectiveness of its education system, leading to improved student outcomes and better preparation for the demands of the modern world.

3.2 Prospects and challenges of school reform in Ukraine

Due to the large-scale Russian aggression against Ukraine, millions of Ukrainian children have been forced to interrupt their education, become internally displaced persons in regions of Ukraine with better security, or flee to other countries abroad. Thousands of educational institutions have been damaged by the barbaric shelling and bombing by the

Russian army, with hundreds completely destroyed. The introduction of martial law and the reduction in economic activity have led to a significant deficit, affecting both state and local budgets. This has resulted in substantial cuts in education spending, as all available resources need to be mobilized to meet defense and humanitarian needs.

In the current conditions, Ukraine is facing a significant phenomenon of "brain drain," involving the mass emigration of highly educated and skilled professionals to other countries. This issue has been particularly exacerbated by the large-scale Russian aggression, which has forced many educators, including teachers, pedagogues, and school administrators, to seek safety and stability abroad. [36]

The brain drain in the field of school education has serious consequences for Ukraine. Firstly, it leads to the loss of qualified educators who are essential for providing quality education and nurturing future generations. Secondly, it reduces the potential for educational innovations, which are crucial for preparing students to face modern challenges and rapid changes in the world. [37]

To address the problem of brain drain in school education, comprehensive measures are needed. These include creating favorable conditions for the return of educators to Ukraine, developing programs that encourage them to stay and work in the country, and actively collaborating with the Ukrainian diaspora. It is also important to ensure safety, political stability, and economic prospects that would encourage young professionals to remain in their homeland. To support education professionals who are refugees from Ukraine, it's important to ensure they stay connected with their home institutions and colleagues. This will help them return home quickly when the war ends. By keeping these connections strong, we can ensure that Ukrainian teachers remain informed and engaged with events back home. This will ease their eventual return and also support the overall resilience and recovery of Ukraine's educational infrastructure after the war. [37]

Ukraine must develop strategies that promote the retention and return of intellectual capital in school education, as these resources are critically important for the future revival and prosperity of the country. Additionally, due to the military aggression, many Ukrainian

students have gone abroad. It is estimated that over 2 million Ukrainian children have become refugees, continuing their education in other countries. This situation further underscores the importance of supporting and maintaining educational ties with Ukraine to ensure these students can return to their schools once the conflict is over. [37]

Moreover, according to statistics, most teachers and administrative representatives (63% and 66%) report a decline in academic performance, while only 10% and 5% respectively report an improvement (27% and 29% see no change). Only 21% of students report a decline in their performance, while 39% believe their performance has improved (the remaining 40% see no change). Meanwhile, parents hold a relatively "intermediate" position but tend towards a more optimistic view. 30% feel their children's performance has worsened, while 24% believe it has improved (46% see no change). [38]

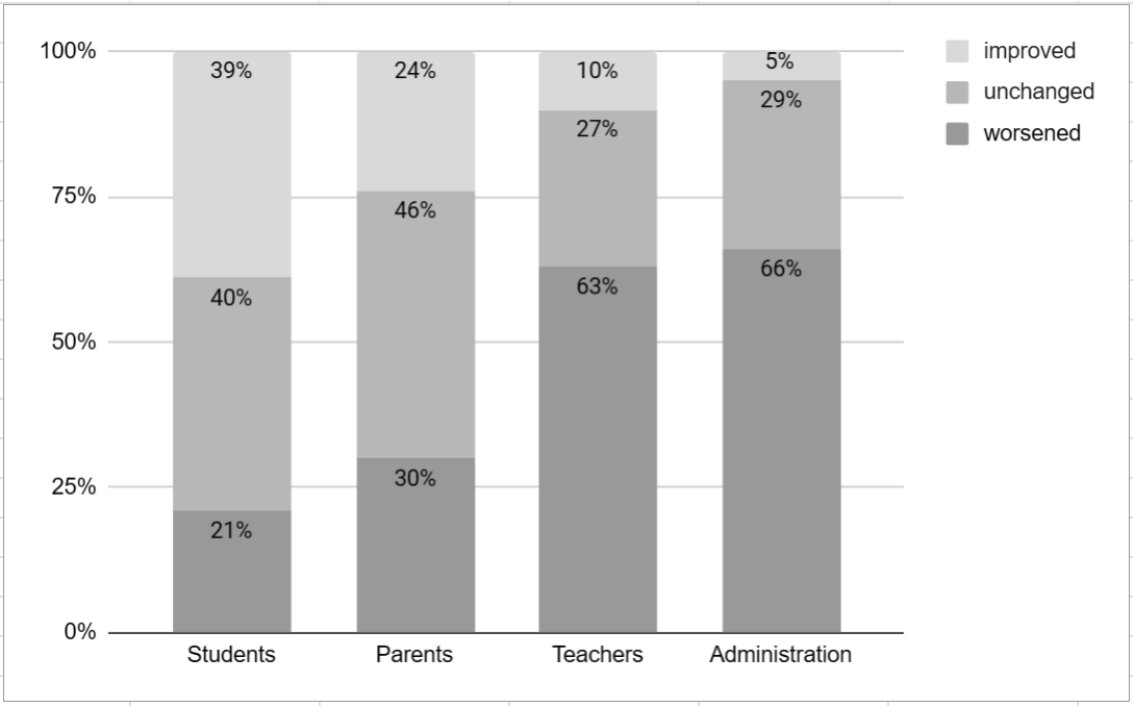

Figure 3.1 – Academic performance of students compared to the period before February 24, 2022 [38]

The primary platforms for dialogue with international partners include the Education Cluster: Ukraine and the Sectoral Working Group "Education and Science" at the Ministry

of Education and Science of Ukraine. The participants of this group include international organizations, diplomatic missions of foreign states, non-governmental organizations, and projects implementing support programs for Ukrainian education and science. It coordinates the mobilization and utilization of international assistance aimed at supporting the implementation of state policies to achieve stated strategic priorities in the field of education and science. [39]

The Ministry of Education and Science of Ukraine has developed 11 project proposals to address the urgent needs of the education sector during the period of martial law, corresponding to key priorities of educational policy. Their timely implementation can minimize educational losses and enhance the resilience of Ukrainian education during wartime. Among them are:

1. Digital devices for education – a project aimed at purchasing laptops and tablets for students and educators to ensure continuous access to education for students and provide teachers with the opportunity to teach using distance learning technologies.
2. Admission campaign – modernization of the Unified State Electronic Database on Education to ensure a transparent, competitive, and secure admission procedure to Ukrainian colleges and universities.
3. Publication of textbooks and manuals for the New Ukrainian School – a project to facilitate the implementation of the New Ukrainian School reform at the level of basic secondary education, starting from the 5th grade.
4. Establishment of educational hubs abroad – a project aimed at connecting Ukrainian refugees abroad with the Ukrainian education system, providing them with the opportunity to study according to state standards, receive educational consultations, and psychological support.
5. Expansion of the school bus fleet for general secondary education institutions, allowing transportation of students, especially from schools that have been destroyed, to institutions where classes are held.

6. STEM education is highly relevant today and an integral part of the New Ukrainian School reform, providing every 5th-grade student with access to modern learning tools.

7. Digital education passport, which involves the creation of a digital educational ecosystem to track the educational trajectory of each student to facilitate teachers' work and digitalization of management processes in education.

8. Development of catch-up educational programs and tools – a project aimed at assessing educational losses and solving this problem by creating and implementing programs and tools for catch-up learning.

9. Establishment of sector-specific training centers – a project in the field of vocational education aimed at scaling up the existing successful practice of creating training centers based on vocational schools to intensively train skilled workers according to the needs of the Ukrainian economy.

10. Career guidance and career building "Choose the profession of your dream" – a relevant task considering the need to create conditions for conscious choice of profession by young Ukrainians.

11. Training of teachers/students in providing pre-medical assistance – a project whose relevance is undeniable, especially in wartime conditions, and also in the post-war period. [40]

By implementing these projects and drawing on the successful experiences of Germany, Ukraine can improve the quality and competitiveness of its education system, ultimately fostering national resilience and contributing to the long-term development and prosperity of the country.

CONCLUTIONS

The education system stands as one of the fundamental social institutions that shape national competitiveness of the country. This recognition drives the necessity to transition towards a new educational paradigm—one that prioritizes maximizing human potential as the primary goal, pivotal metric, and central driver of contemporary progress. Acknowledging education's economic role, evaluating its efficacy and competitiveness, and aligning its trajectory with economic expectations are pivotal challenges that will determine the reconciliation between educational output and economic demands.

Ukraine has already shown its efforts to improve school education in Ukraine through the "New Ukrainian School" reform. It reflects current trends in education and has the potential to become a key catalyst for positive changes in Ukraine's education system. The advantages of the new Ukrainian school include modern teaching methods, an inclusive approach, and the use of innovative technologies. Main challenges to Ukraine's education system in times of war include threats to the lives and health of participants, extensive destruction of educational infrastructure, forced displacement of students and faculty, disrupted access to education, loss of educational control in occupied territories, and reduced government spending on education.

Based on the research, it should be said that Ukraine can take into account a number of aspects of the German school system that may be useful for the further development of its own system. First, Germany's post-war reconstruction is an impressive example of how the country managed to transform a devastated education system into a modern and efficient one. After the Second World War, most schools and universities in Germany were destroyed, and there was a threat of losing the scientific and cultural heritage. An important part of the process was the use of innovative approaches and best pedagogical practices. German educational institutions actively cooperated with international organisations and partners from other countries, sharing knowledge and experience. This contributed to the

rapid adaptation to modern trends in education and the development of innovative approaches to learning.

The German school structure is quite developed and flexible, making it an interesting object for study and possible application in Ukraine. Ukraine could take this school structure into account when considering how to improve its own system. For example, consider introducing greater flexibility and individualisation in school choice to ensure that every student has access to a quality education that is tailored to their abilities and needs. It is also important to ensure social equity in access to higher education to avoid discrimination based on social status or place of residence.

In addition, education reforms are an important means of improving the quality of education and the development of pupils and students in Germany and Ukraine. Germany is implementing a variety of reforms aimed at improving education. For example, they are focusing on creating more flexible study programmes that more closely match the needs of the labour market. Other reforms are aimed at improving the quality of teaching through teacher support and professional development. Another important aspect of the reforms is to make education more accessible to all segments of society and to reduce social inequality in education.

For Ukraine, it is important to study Germany's experience in implementing educational reforms and take it into account when formulating its own education development strategy. For example, Ukrainian reforms could focus on modernising curricula, supporting teachers, and reducing social inequalities in access to education. Such reforms can contribute to improving the quality of education, preparing a competitive workforce, and social development of the country.

The correlation between the process of education and the qualification growth of employees in accordance with modern needs necessitates investment in the development of the knowledge system of the scientific fund of society, in basic and applied research, qualification growth and improvement of the structure of the scientific and pedagogical staff of educational institutions, strengthening their social protection in the conditions of

market formation, that is, everything that allows scientific knowledge to become more accessible and helps to obtain a higher return on specialists in the implementation of

One of the most important factors in the competitiveness of education is its funding, which also determines the level of accessibility and quality in the country. In Germany, education is financed at both the federal and state levels. This ensures greater financial stability and decentralisation of education management. A lot of resources are allocated to supporting teachers, providing teaching materials and technological tools. Germany's experience in this aspect could be useful for Ukraine in improving its education financing system.

In Germany and Ukraine, political factors have different characteristics and influence on the education system. In Germany, political decisions are usually based on consensus between the federal government and the federal states. This ensures stability of education management and implementation of common development strategies. In addition, political parties influence education policy making through their programmes and legislative initiatives. In Ukraine, political parties and the government set priorities for education development, including legislative changes, financial resources and strategic goals. However, instability in the political environment affects the implementation of educational reforms and the development of the system.

Taking into account the experience of Germany, Ukraine can focus on building a stable political consensus in the education sector, which will facilitate effective governance and implementation of strategic development goals. It is also important to ensure transparency and openness in policy-making in the education sector to involve the public in important decision-making.

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APPENDICES

Appendix A

Table A.1 – Main indicators of school types [14]

Type of School	Conditions of Education
Secondary general school (Hauptschule)	Studying up to the ninth grade. Students with low academic performance are usually enrolled here. The basic school was created to prepare students for practical work and craft professions. Graduates receive a certificate of lower secondary education, which allows them to enter a vocational school (Berufsschule). Teaching in basic schools tends to be less intensive and less challenging than in other types of schools.
Secondary school (Realschule)	Education lasts from 5th to 10th grade. A real school provides extended general education and training for a variety of professions. Upon graduation, students receive a certificate of secondary education (mittlere Reife), which opens up wide opportunities for work and further education.
Academic secondary school (Gymnasium)	Schooling lasts until the twelfth or thirteenth grade, depending on the federal state. Gymnasiums provide a deep and comprehensive education. Students choose several subjects to study in depth, usually in the 11th grade. Upon successful completion, graduates receive the "Matriculation Certificate for Entry into Higher Education", which entitles them to study at all universities. Gymnasiums are renowned for their high academic standards and preparation for university entrance.
Comprehensive school (Gesamtschule)	Students from grades 5 to 10 study in mixed classes that combine elements of basic, real and gymnasium education. Upon graduation, students receive a certificate that allows them to continue their education in upper grades of a gymnasium or in any vocational school.
Special School (Sonderschule)	Studying typically lasts for the standard duration of schooling, which is usually 9 to 12 years, depending on the educational system and the age at which students enter the school. It is designed for children with physical or mental disabilities who cannot be educated in mainstream schools but are required to acquire schooling. After completing a special school, students have the opportunity to study in schools that provide one-year pre-vocational training and, after passing the necessary exams, in the dual system.

Appendix B

Table B.4 – Main indicators of school types [25,28]

Aspect	Ukraine	Germany
Financing and management		
Centralised funding	The main resources come from the state budget through subventions to local budgets	Responsibility for funding lies with the Länder (regions)
Distribution of subventions	Subventions are distributed on the basis of standards that take into account the number of students	Funding is provided from both the state and local budgets
The role of local authorities	Local authorities are responsible for school maintenance	Länder have autonomy in determining budgets for schools
Financing of educational programmes and teaching materials		
State standards	The state determines curriculum standards and provides textbooks	Each Lander has its own curriculum
Insufficient funding	Problems with financing educational programmes due to limited resources	Adequate funding due to high level of economic development
Support for schools		
Government support programmes	Government programmes aimed at improving the material and technical base of schools	Stable support from the Lander and local authorities
Public funding	Dependent on support from parents and charitable organisations	Public initiatives and foundations additionally support schools